11/18/85 u2480-1-u

World Food Trade and U.S. Agriculture, 1960-1984

African Food Crisis Continues

October 1985
Fifth Annual Edition

THE WORLD
FOOD INSTITUTE
Iowa State University
Ames, Iowa

Abstract

World grain and oilseed production in 1984-85 increased sharply with favorable weather in most major producing areas except Canada, Africa, and USSR. Increased production also was due to a strong upward trend in crop yields in the European Community, India, and China that has shifted these areas from large importers of U.S. farm products to exporter positions and competitors of the U.S. Increased production in these areas reflects new crop varieties, increased use of fertilizer and other inputs, and changes in China's economic system to provide incentives for farm workers to increase productivity. With relatively steady world livestock production and demand for livestock feed ingredients, competition intensified in world grain and oilseed markets in 1984-85, and carryover stocks of these commodities are again increasing.

In this environment, exports of U.S. farm products and U.S. shares of world trade have been restricted more than those of other exporters, partly because of a strong U.S. dollar that reduces the price-competitiveness of American farm products. Reduced exports are one of several factors contributing to serious financial stresses in the U.S. agricultural sector.

The current trade environment is generating strong pressures for increased protectionism in trade policies, as trading partners attempt to maintain or expand their share of global exports while protecting domestic industries from import competition. More appropriate policies might focus on causes of slow growth in world trade.

Key words: Grain, oilseeds, corn, soybeans, wheat, agricultural exports, global food, world agricultural trade, U.S. trade, trade policies, agricultural imports, Soviet grain imports, Chinese grain imports, world livestock production, variable levies, threshold prices, and African food situation.

By Robert N. Wisner, professor of economics, and Tahereh Nourbakhsh, graduate research assistant, Department of Economics. Edited by Joy Banyas, communication specialist, Extension Information Service.

Available from:
World Food Institute
102 E. O. Building
Iowa State University
Ames, Iowa 50011

ISSN 0733-2378

Contents

vi **Foreword**

1 **Summary and Implications**

3 **Introduction**

4 **1984-85 World Food Situation: Increased Trade, Utilization, Stocks, and African Food Crisis**
4 World Grain Trade Up for Second Consecutive Year
5 Short and Intermediate Term Prospects
5 Record World Wheat Production for Fourth Consecutive Year, Stocks Rise
6 World Coarse Grain Supplies Up Sharply, Stocks Rise Modestly
8 World Rice Production, Utilization, Stocks Up Modestly
8 World Oilseed Production Up Sharply
11 Trends in World Grain Area Harvested
12 World Coarse Grain Area Up Sharply in 1984-85
13 Europe, Canada, Australia Expand Wheat Area
13 Rice Area Continues Long-term Upward Trend
14 Trends in Global Grain Yields
14 Trends in Soybean and Oilseed Area and Yields
15 Longer Term Upward Trends in Soybean Area
15 Government Programs and Changing U.S. Soybean Cropping Patterns
16 Future Trends in Global Soybean Area and Yields
17 Cassava Root Production Increases
18 Global Pulse Production Relatively Stable
18 World Livestock and Poultry Meat Production Trends
18 Pork and Beef Production Expand Slowly
19 Poultry Meat Production Continues Slight Upward Trend

20 **U.S. Shares of World Wheat and Coarse Grain Trade Down**
20 Longer-term Wheat Trade Patterns
21 Coarse Grain Export Shares

23 **Soybean and Soybean Product Trade Shares**
23 Soybeans
23 Soybean Meal
24 Soybean Oil

25 **Trade Shares in Livestock Product Exports**
25 Beef and Veal Exports
26 Pork Export Shares
26 Poultry Meat Export Shares

27 **Potato Production Trends, Eastern Europe**

28 **Trends in World Fish Production**

29 **Developments in Soviet Agriculture and U.S. Trade Relationships**
29 1984-85 Soviet Grain Imports Set New Record
29 Longer-term Grain Production Prospects
31 Oilseed Prospects
31 Livestock Sector
31 U.S.-USSR Grain Agreement

32 **Financial Developments Affecting U.S. and World Agricultural Trade**
32 Key Problem Areas
32 Debt Burden of Developing Nations
33 Currency Exchange Rates

35 **Trends in African Food Production and Imports**
35 Population Growth Trends
35 Grain Production Trend
35 Corn
36 Wheat
37 Rice
37 Fertilizer Use in Africa
37 Irrigation Use Limited
37 Trends in African Grain Imports
37 African Diets vs. Dietary Energy Standards

39 **Three Success Stories in Grain Production: EC, China, and India**
39 European Community
40 China
40 India

41 **U.S. Agricultural Exports Up in 1984, but Ag Trade Balance Declines**

43 **U.S. Government-assisted Export Programs: Blended Credit Halted, Export Payment-In-Kind Initiated**
43 Types of Assistance Programs
43 Blended Credit Program Dropped, U.S. Government Loan Guarantees Continued
43 Reasons for Halting Blended Credit Program

45 **U.S. Trade Trends by Commodity Groups**
45 Composition of U.S. Agricultural Exports
45 U.S. Agricultural Imports
49 U.S. Agricultural Exports by Leading States and Economic Groupings of Destinations
51 Trends in U.S. Corn and Coarse Grain Exports by Destination
52 Trends in U.S. Soybean and Soybean Product Exports by Destination
55 U.S. Wheat Exports by Destination
56 Trends in U.S. Red Meat and Poultry Exports by Destination

58 **Trade Policy Issues in the Late 1980s**
58 Dealing with Exchange-rate Problems
59 Trade Subsidies
59 Debt Problems of Developing Nations
59 Trade Protectionism
59 Food Security
60 Other Policy Issues

61 Notes

63 Bibliography

65 Appendix I. Food Production and Population Trends by Economic and Geographic Classification of Countries

71 Appendix II. Flow Patterns and Table Showing Destinations and Ports of U.S. Grain Exports in 1973-74 and 1983-84

74 Appendix III. Flow Patterns Showing Sources of U.S. Pork and Beef Imports

75 Appendix IV. U.S. Concessional Farm Product Exports by Commodities and Program Areas, 1977 and 1979-84 Fiscal Years

List of Tables

1. Combined World Supplies, Utilization, Trade, and Stocks of All Grains in 1984-85, Projections for 1985-86, and Comparisons with Selected Recent Years in Millions of Metric Tons 4
2. World Wheat Production, Utilization, Trade, and Carryover Stocks in Millions of Metric Tons in 1984-85 and Selected Recent Years 6
3. World Coarse Grain Production, Utilization, Trade, and Carryover Stocks in Millions of Metric Tons in 1984-85 and Selected Recent Years 7
4. World Milled Rice Production, Utilization, Trade, and Carryover Stocks in Millions of Metric Tons in 1984-85 and Selected Recent Years 8
5. World, U.S., and Foreign Production of Oilseed Products and Fats in 1972-73, 1979-80, 1982-83, 1983-84, and 1984-85 in Millions of Metric Tons 9
6. Wheat and Coarse Grain Area Harvested in Millions of Hectares in Major Producing Countries, 1984-85 and Comparisons with Recent Years 12
7. Comparative Yields in Metric Tons per Hectare of Selected Grain Producing Countries 14
8. Soybean Area Harvested in Millions of Hectares in Major Producing Countries, 1984-85 and Comparisons with Recent Years 14
9. Comparative Yields in Metric Tons per Hectare of Selected Soybean Producing Countries 17
10. Cassava Production in Major Producing Nations from 1973 through 1984 in Millions of Metric Tons 18
11. World Pulses Production in Major Producing Areas, 1971-83, in Millions of Metric Tons 18
12. Pork Production in Major World Producing Areas, 1974-78 Average and 1980 through 1985 in Millions of Metric Tons 19
13. Beef and Veal Production in Major World Producing Areas, 1974-78 Average and 1980 through 1985 in Millions of Metric Tons 19
14. Total Poultry Production in Major World Producing Areas, 1974-78 Average and 1980 through 1985 in Millions of Metric Tons 19
15. World Poultry Meat Exports by Major Exporters, 1974-78 Average and 1979 through 1985 in Thousands of Metric Tons 26
16. Global Catch of Fish, Crustaceans, and Molluscs, Selected Years and Regions, 1973 to 1983 in Millions of Metric Tons 28
17. Soviet Grain, Soybean, and Soybean Meal Importing Patterns in Millions of Metric Tons, 1975-76 through 1984-85 30
18. Soviet Oilseed Production in Millions of Metric Tons, 1972-73 through 1984-85 31
19. Estimated Outstanding Debt of Selected Nations in Billions of U.S. Dollars in 1984 32
20. Chicago Cash Corn and Soybean Prices in U.S. Dollars and Foreign Currency Equivalents 1977 and 1980-85 34
21. African Population by Region, Selected Years, 1970 through 1983 35
22. Production of Wheat, Rice, and Corn in Africa by Region, Selected Years, 1970 through 1983 in Millions of Metric Tons 36
23. African Grain Imports by Region in Millions of Metric Tons, 1970 and Yearly Average for 1980-83 37
24. Percentage of Per Capita Standard Dietary Energy Requirements Available in Average Diets of Selected African Nations 38
25. U.S. Concessional Government Agricultural Exports as Percent of Total Exports by Major Commodities, Fiscal Years 1977 and 1979 through 1984 43
26. Composition of U.S. Agricultural Exports by Type of Commodity 1976-77, 1980-81, 1981-82, 1982-83, and 1983-84 in Billions of Dollars 45
27. Value of U.S. Agricultural Imports in 1975-76, 1980-81, 1981-82, 1982-83, and 1983-84 October-September Fiscal Years by Commodity Groups in Billions of Dollars 46

List of Figures

1. Annual Change in Total World Grain Trade, 1961-62 through 1985-86 in Millions of Metric Tons 4

2. World Grain Production and Consumption in Millions of Metric Tons, and Carryover Stocks as Percentage of Annual Consumption, July-June, 1960-61 to 1984-85 5

3. Wheat Exports by Major Non-U.S. Exporters, July-June 1985-86 and Comparisons with Recent Years in Millions of Metric Tons 6

4. Coarse Grain Exports by Major Non-U.S. Exporters, October-September 1984-85 and Comparisons with Recent Years in Millions of Metric Tons 7

5. World Protein Meal Production by Type of Product, 1972-73 through 1984-85 9

6. World Fat and Oil Production by Type of Product, 1965-66 through 1984-85 10

7. World Soybean Exports by Country of Origin, Calendar Years 1962 to 1983 10

8. World Soybean Cake Exports by Country of Origin, Calendar Years 1962 to 1983 11

9. World Soybean Oil Exports by Country of Origin, Calendar Years 1962 to 1983 11

10. World Harvested Area Devoted to Individual Grains in Millions of Hectares, 1960-61 through 1984-85 12

11. World Grain Yields in Metric Tons per Hectare, 1960-61 through 1985-86 13

12. U.S. Corn Yields in Bushels per Acre, 1950-84 13

13. World Yields in Metric Tons per Hectare, and Harvested Area Devoted to Major Oilseeds, 1977-78 through 1984-85 15

14. World Area Harvested in Millions of Hectares of Selected Oilseeds, 1972-77 Average and 1977-78 through 1984-85 16

15. World Yields in Metric Tons per Hectare of Selected Oilseeds, 1972-77 Average and 1977-78 through 1984-85 16

16. U.S. Soybean Yields in Bushels per Acre, 1950-85 17

17. Percentage Shares of World Wheat Trade by Major Exporters, July-June, 1970-71 to 1984-85 20

18. World Wheat Exports by Country of Origin, Calendar Years 1962-1983 20

19. Percentage Shares of World Coarse Grain Exports by Major Exporters 1970-71 to 1984-85 21

20. World Corn Exports by Country of Origin, Calendar Years 1962 to 1983 22

21. World Coarse Grain Exports by Country of Origin, Calendar Years 1962 to 1983 22

22. Percentage Shares of World Soybean Trade by Major Exporters, October-September, 1975-76 to 1984-85 23

23. Percentage Shares of World Soybean Meal Trade by Major Exporters, October-September, 1975-76 to 1984-85 24

24. Percentage Shares of World Soybean Oil Trade by Major Exporters, October-September, 1975-76 to 1984-85 24

25. Percentage Shares of World Beef and Veal Trade by Major Exporters, 1970-85 Calendar Years 25

26. Percentage Shares of World Pork Trade by Major Exporters, 1970-85 Calendar Years 25

27. World Potato Production in Millions of Metric Tons by Major Producing Areas, 1962-83 Calendar Years 27

28. Relationship Between Changes in Soviet Grain Production and Imports, 1970-71 through 1984-85 29

29. Trend in Soviet Grain Yields in Metric Tons per Hectare, 1965 through 1984 30

30. Geographic Divisions for Africa 35

31. Trend in EC-10 Grain Production, 1970-71 to 1984-85 39

32. Trend in Chinese Grain Production, 1970-71 to 1984-85 40

33. Trend in Indian Grain Production 1970-71 to 1984-85 40

34. Dollar Value of U.S. Agricultural Exports and Imports, 1972-84 Calendar Years 41

35. Net U.S. Trade Balance in Agriculture and Non-Agricultural Products by Calendar Years, 1955 through 1960 41

36. Dollar Value of U.S. Agricultural Exports under Government-assisted Programs and Other Sales 1970-84 Fiscal Years 44

37. Distribution of Commodity Credit Corporation Export Credit Guarantees and Blended Credit Export Programs by Destinations and Products, Fiscal Year 1983-84 44

38. Value of U.S. Agricultural Exports by Commodity, 1970-84 Calendar Years 45

39. Value of U.S. Agricultural Imports by Commodity, 1972-84 Calendar Years 47

40. Value of U.S. Livestock Product Exports by Type of Product, 1973-84 Calendar Years 47

41. Value of U.S. Red Meat Imports by Type of Product, 1973-84 Calendar Years 48

42. Value of U.S. Agricultural Exports by Selected States in Billions of Dollars, Fiscal Years 1980-81 through 1983-84 49

43. U.S. Agricultural Export Percentage Shares to Selected Destinations, 1976-77 and Projected 1984-85 Fiscal Years 49

44. U.S. Wheat Export Percentage Shares to Selected Destinations, October-September 1972-73 and 1983-84 50

45. U.S. Corn Export Percentage Shares to Selected Destinations, October-September 1972-73 and 1983-84 50

46. U.S. Corn Exports by Destination, October-September 1963-64 to 1984-85 51

47. U.S. Coarse Grain Exports by Destination, October-September 1963-64 to 1984-85 51

48. U.S. Soybean Exports by Destination, October-September 1963-64 to 1984-85 52

49. U.S. Soybean Meal Exports by Destination, October-September 1963-64 to 1984-85 53

50. U.S. Soybean Oil Exports by Destination, October-September 1963-64 to 1984-85 54

51. U.S. Wheat Exports by Destination, October-September 1962-63 to 1984-85 55

52. U.S. Beef and Veal Exports by Major Destinations, 1976-77 through 1983-84 October-September Fiscal Years 56

53. U.S. Pork Exports by Major Destinations, 1975-76 through 1983-84 October-September Fiscal Years 56

54. U.S. Exports of Edible Offals and Variety Meats by Major Destinations, 1975-76 through 1983-84 October-September Fiscal Years 57

55. U.S. Fresh and Frozen Chicken and Turkey Exports by Major Destinations, 1975-76 through 1983-84 October-September Fiscal Years 57

Foreword

The first edition of *World Food Trade and U.S. Agriculture, 1960-80* was released in October 1981 in conjunction with the first annual World Food Day. This fifth report extends the analysis of patterns of world food trade into 1984 with some projections into 1985. Production of food and feed grains in 1984-85 exceeded utilization by about 38 million metric tons and global stocks are expected to equal about 13.7 percent of annual utilization at the end of the trade year. The world's stocks of grain, therefore, will have been increased in each of the last two trade years.

Although grain supplies appear to be plentiful in the aggregate, food problems in Africa continue to deteriorate and the United Nations has established an Office for Emergency Operations in Africa. This UN office and the Global Information and Early Warning System on Food and Agriculture of the Food and Agriculture Organization, Rome, are providing monthly updates on food aid needs, food supply prospects, and difficulties in handling and distributing foods in the most seriously affected countries. An analysis of the complex interacting forces affecting food availability in Sub-Saharan Africa has been included in this edition of *World Food Trade and U.S. Agriculture, 1960-1984*.

Paradoxically, while shortages of food are affecting millions of people in Africa, the U.S. agricultural sector is accumulating carryover stocks while producing far below maximum capacity. The U.S. trade shares for many commodities continued to decrease while imports of agricultural products increased in 1984; therefore, the net balance of U.S. agricultural trade declined for the third consecutive year. Wisner and his graduate research assistant have examined the factors that have caused the most severe financial stress to U.S. agriculture (and agribusinesses) since the 1930s. They concluded that the outlook is bleak; they project that a slow gradual expansion of world trade in farm products will occur in the future accompanied by increased competition from exporting countries, several of whom have recently shifted from being importers to exporters. They believe a realistic approach to current trade problems should deal with the underlying causes of the slow growth in trade; for example, the world debt problem, high real interest rates, and fiscal and monetary policies of the U.S. and other nations. These problems, however, are not easily resolved. In the meantime, food security will continue to be an important issue for many countries.

The World Food Institute of Iowa State University hopes that this fifth annual edition of *World Food Trade and U.S. Agriculture, 1960-1984* will continue to help readers understand the complex interrelationships that exist among and within food-exporting and food-importing nations. It seems clear that the trade patterns and growth in the 1980s differ dramatically from those in the 1970s. Important decisions, with respect to investment in agricultural production and marketing and with respect to public policy, depend on understanding the factors underlying changes in demand for farm products and in competition for world markets. If readers have suggestions that would increase the usefulness of future editions, please send them to me or to Dr. Wisner.

The World Food Institute of Iowa State University was established in 1972 by the Iowa Board of Regents to focus the university's "competencies and leadership upon the provision of adequate and nutritious food supplies for the world's peoples through research and education." An annual report on the changing patterns of world food trade and their implications for U.S. agriculture was recommended by the Faculty Policy Committee of the World Food Institute in 1980. Its purposes are: (1) to disseminate a comprehensive but understandable picture of the world food situation, the role of U.S. agricultural exports in world trade and the impact of trade on U.S. agriculture; and (2) to identify emerging issues that will influence U.S. and world agricultural trade. It is intended to serve as a resource for scholars and citizens, for producers and consumers, for policymakers, and for others who are concerned with alleviating the world's food problems. Robert N. Wisner, professor of economics at Iowa State University, has directed this project from the beginning. The World Food Institute is pleased that he has been able to distill large amounts of data into understandable tables and graphs together with concise comments about trends.

Charlotte E. Roderuck
Director, World Food Institute
Iowa State University

Summary and Implications

The world agricultural situation in 1984-85 reflected one of the largest increases in global grain production on record, along with slightly accelerated growth in utilization, a partial rebuilding of grain stocks, and a substantial increase in oilseed production. Combined world production of all grains rose 10 percent above the previous season and 6.5 percent above the previous record two years earlier. Increased production reflected generally favorable weather in U.S., Western Europe, China, India, Australia, and South America, as well as expiration of the U.S. Payment-In-Kind Program for coarse grains. The Payment-In-Kind Program and severe drought had sharply curtailed U.S. grain production in 1983. Large crops in these areas were only partially offset by severe drought in USSR, Canada, and parts of Africa.

With ample supplies and a modest expansion in global economic output, world grain utilization rose about 3 percent in 1984-85, reaching a record 1.6 billion metric tons. World grain trade expanded modestly and exceeded the 1980-81 record by about 2.8 percent. However, U.S. agriculture faced increasingly intense competition as several former importing nations became exporters and the strong U.S. dollar placed American farm products at an increasingly large disadvantage in world markets. With strong competition, the volume of exports of most major U.S. agricultural products remained well below previous records of the late 1970s and early 1980s. Expanded world production brought an increase in grain carryover stocks, especially in the U.S., the European Community (EC), and India. Global grain stocks at the end of 1984-85 are expected to be equivalent to about 13.7 percent of annual utilization, somewhat below the recent high of 16.7 percent in 1982-83.

Early indications point to a further increase in world grain production in 1985-86, with carryover stocks possibly reaching or slightly exceeding 1982-83 levels. While global livestock production has been relatively steady for the past two years, plentiful feed supplies and low prices for grain and protein meals may encourage expanded livestock numbers in some areas by the latter part of the 1985-86 trade year. Early indicators point to continued large grain supplies in three key areas that have recently shifted from importing to exporter positions. These three areas are EC, China, and India. All have been large markets for U.S. coarse grain, soybeans, and/or wheat within the past eight years. Rising production in these nations reflects the adoption of yield-increasing technology in crop production. In China, restructuring of its economic systems also appears to be an important factor behind sharply increased grain production.

Despite plentiful aggregate world grain supplies, African food problems deteriorated further in 1984-85. Food problems there reflect a complex interaction of forces including drought and rapid population growth, as well as socioeconomic conditions and government policies that have restrained investments in agriculture. Worsening food problems in Sub-Saharan Africa brought a sharp rise in food aid shipments to the area along with serious logistical problems in getting food supplies distributed where needed. Chronic food shortages in that area represent a major challenge for the world community for the next several years.

U.S. export shares of major grains and oilseeds and most livestock products have dropped substantially from the record levels of the 1979-81 period. For most major commodities, with the exception of corn and beef, U.S. shares of global exports continued their downward trend in 1984-85. For example, U.S. wheat exports accounted for 48 percent of global trade in 1981-82 and had dropped to a 36 percent share by 1984-85. U.S. coarse grain exports accounted for about 72 percent of global trade in 1979-80, but declined to approximately 56 percent in 1984-85. U.S. poultry meat exports have dropped from 22 percent of world trade at the start of this decade to only 12 percent in the 1984-85 trade year. Declining U.S. trade shares reflect a slower rate of expansion in world demand for agricultural products in the last few years than in the 1970s, along with increased production and exports from Brazil, Argentina, Australia, China, India, Canada, and Western Europe.

Despite declining trade shares, U.S. agricultural exports in dollar value increased modestly in 1984. The increase was due to temporarily higher prices for major crops, and resulted primarily from a severe 1983 U.S. drought and the Payment-In-Kind (PIK) Program, which sharply curtailed crop production. U.S. agricultural exports were valued at $37.8 billion dollars in 1984, up 4.8 percent from the previous year but approximately one-fifth below peak levels three years earlier. U.S. agricultural exports are declining in dollar value again, in 1985, as a result of lower prices for most farm products and reduced export volumes of some important commodities. The strong U.S. dollar, and rising U.S. incomes and employment levels brought an increase in U.S. imports of agricultural products in 1984, with a resulting decline in the net balance of U.S. agricultural trade for the third consecutive year.

The continuing downward trend of U.S. agricultural exports is one of several factors causing the most severe financial stress to U.S. agriculture and agribusiness since the 1930s, and is a matter of serious concern. Evidence of such stress includes: (1) surveys showing nearly one-third of the farmers in some key U.S. agricultural areas face moderate to severe financial problems; (2) failure of the largest number of U.S. agricultural lending institutions since the 1930s (although such failures have been far below the levels of the 1930s and safeguards against such problems are much stronger than 50 years ago); (3) severe financial losses in the North American farm machinery industry; and (4) a U.S. grain marketing and transportation system operating far below maximum capacity. With about one-third of U.S. farmers' total output in recent years being destined for export markets and with American farmers being dependent on exports for a similar portion of their income, weakness in export markets has had significant impact on U.S. production agriculture. However, the impact goes far beyond farmers. It includes depressed employment and income levels in farm supply and marketing firms, as well as in rural communities in major agricultural areas.

Emerging trends suggest that world trade in farm products will expand gradually in the next few years as the world economy resumes its upward course and developing nations adjust to debt burdens through extended repayment periods, increased domestic productivity, expanded barter trade, and a number of other changes in their economies. In addition, U.S. fiscal, monetary, and agricultural policies appear to be moving in a direction that may facilitate some expansion in U.S. and world trade. However, competition in world agricultural markets appears likely to remain intense in the next few years because of technological and economic changes in several major importing and exporting nations.

In the current environment of slowly expanding world trade and excess agricultural production capacity in several exporting nations, trading partners are facing strong pressures to maintain or expand their shares of global exports. Pressures are originating from depressed incomes in agricultural sectors, costs of storing surplus agricultural commodities, and the need for foreign exchange earnings to meet debt repayment schedules and/or offset trade deficits in nonagricultural sectors. Policies being used in an attempt to expand trade shares include export subsidies and special financing terms for importers.

Most major trading partners, including the U.S., also are facing increasingly strong pressure for protection of domestic industries from foreign competition. These pressures are being experienced in both agricultural and nonagricultural sectors, and are creating the potential for a serious world trade war. In the late 1920s and 1930s, similar conditions resulted in severe trade restrictions, with a resulting sharp drop in global trade, economic output, and employment. The lessons of that time period continue to be a strong caution indicating a need to resist temptations to move toward increasingly protectionist trade policies.

A more realistic approach to current trade problems might be for major trading partners to deal jointly with the underlying causes of current slow growth in trade and economic output. These problems have their roots in the world debt problem, high real interest rates, and the fiscal and monetary policies of U.S. and other nations. Resolution of these problems will be difficult and may require several years. However, increased attention to these areas appears likely to be more fruitful than a movement toward increased protectionism.

Global food security continues to be an important issue for people of many developing countries, despite problems of agricultural surpluses in the U.S. and some other developed nations. Policies for dealing with food security encompass both short- and long-run dimensions, with complex issues in both time horizons. World food security has important implications both for the well-being of people of developing nations and for world peace.

Introduction

It is becoming increasingly evident that the world food and agricultural trade situation is dramatically different from that of the 1970s. Africa's food problems have worsened while supply-demand balances have improved in most other areas. In the 1970s, U.S. production agriculture and the entire U.S. farm supply and marketing systems were operating at or near full capacity in an effort to meet expanding demand. Financial conditions in U.S. agriculture, agriculturally related industries, and rural U.S. communities reflected the strong and growing demand. U.S. shares of global exports for many agricultural commodities increased rapidly. The nation's net trade balance in farm products rose dramatically, partially offsetting a deteriorating trade balance in the nonagricultural sector. Growing demand kept U.S. and world grain carryover stocks at relatively low levels and volatile commodity prices were a trademark of the decade.

At almost the halfway point in the 1980s, nearly all of these conditions have been reversed. World trade in agricultural products has entered a period of slow growth. The entire U.S. agricultural sector is operating far below maximum capacity and is under financial stresses not seen since the 1930s. The U.S. trade shares for many commodities are declining. Several formerly large export markets for U.S. farm products have emerged as competitors in world markets. And after years of advocating reduced import restrictions and subsidies in world trade, the U.S. is finding itself increasing import restrictions and export subsidies, and facing strong internal pressures for further moves in that direction.

In this setting, several key questions arise for those making investment and disinvestment decisions in agriculture and for public policy decision-makers. Critical areas include:

1. What are the sources of the newly emerged competition in world markets, including the countries involved, and the technological and economic underpinnings of that competition?

2. What is the longer-term potential of foreign grain, oilseed, and livestock production?

3. What are the causes of slow growth in world demand?

4. What nations are contributing to the recent downward trend in U.S. shares of global farm product exports?

5. What U.S. and world policies are appropriate in dealing with this environment? Can U.S. agricultural exports be revived through export subsidies, special financing terms, and lower commodity price support loan rates? Is a period of accelerated export demand for U.S. farm products likely in the near future? Will newly emerged competitors be able to maintain their position as exporters?

This report seeks to trace the impacts of the current world environment on U.S. agriculture and to outline major causes of the current intense competition in world markets. Its aim is to provide information that will at least partially answer these questions, and to outline policy alternatives for dealing with current trade and food security questions. The report also is intended to bring out some of the complex interrelationships among U.S. agriculture, the world financial system, and trade and domestic policies of other nations.

1984-85 World Food Situation: Increased Trade, Utilization, Stocks, and African Food Crisis

The 1984-85 trade year has been characterized by adequate global food supplies; the largest one-year increase in world grain utilization since 1982-83; world grain trade slightly above the previous record established in 1980-81; and declining U.S. shares of global wheat, coarse grain, and soybean trade. World grain stocks, as indicated in Table 1, are expected to rise to 13.7 percent of annual utilization by mid-1985, still slightly below commonly accepted standards for world food security. One of the most striking features of the current world food situation is the dramatically increased grain production in the last few years in India, China, and the European Community. These three areas contain nearly half the world's population. Each was a major grain importer during the 1970s but had shifted to an exporter position by 1984-85. Large crops in these areas, along with plentiful supplies in most other grain and oilseed exporting areas except South Africa, have brought intense competition in world wheat, feed grain, and soybean markets. For U.S. grain, cotton, oilseed, and livestock producers, this competition has been heightened by an exceptionally strong U.S. dollar through the first half of the trade year.

Despite abundant aggregate world food supplies, the African food situation deteriorated further in 1984-85. As previous editions of this report have noted, world food problems in recent years have centered on that continent. In 1984-85, Africa's food supply and distribution problems were worsened by widespread drought, low grain stocks, debt problems, high interest rates, the strong U.S. dollar, inadequate domestic marketing, handling and transportation systems, political instability, and other factors. The severe food needs of the African continent have been partially met by food aid from a number of nations. However, Africa's midsection continues to be an area of severe food shortages in the midst of otherwise adequate global food supplies. Policy makers and agriculturalists continue to face a major, long-range challenge in helping to provide the populations of these nations with a more adequate food supply.

World Grain Trade Up for Second Consecutive Year

As Table 1 indicates, 1984-85 world grain trade rose to an estimated record 221 million metric tons—up 6 percent from the previous year and the second consecutive increase since the recent low point in 1982-83. However, the annual growth rate was only about half as large as during the 1971-72 to 1979-80 period. All of the expansion in this year's world grain exports is due to increased import needs of the Soviet Union, which stem from that nation's abnormally low 1984 grain production. Total non-Soviet grain imports declined sharply in 1984-85 with generally good to excellent 1984 crops in Europe, Australia, South America, and non-Soviet Asian countries.

Global grain utilization is estimated at a record 1.6 billion metric tons, 2.8 percent above the previous season's record and with the growth rate slightly exceeding the growth of world population. Increased utilization continues the steady upward trend that remained intact even in the depressed export years of 1981 through 1984. Since

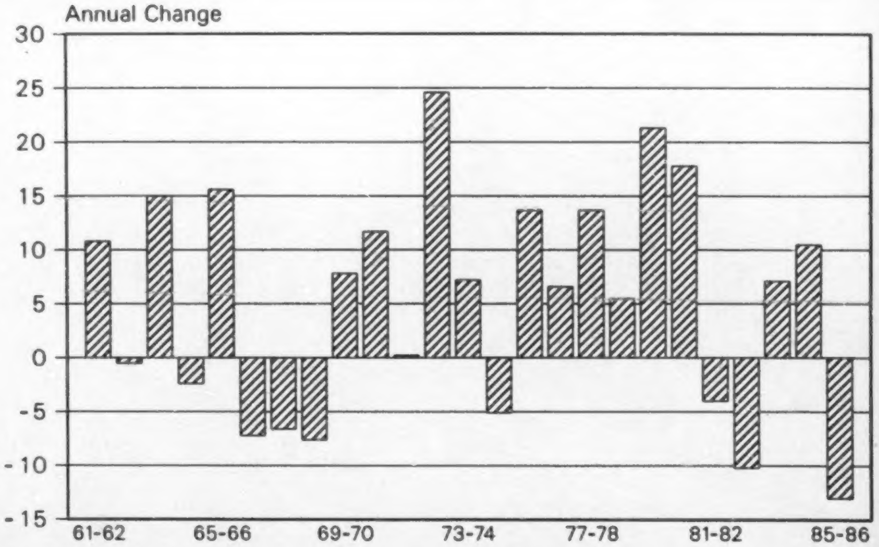
Table 1. Combined World Supplies, Utilization, Trade, and Stocks of All Grains in 1984-85, Projections for 1985-86 and Comparisons with Selected Recent Years in Millions of Metric Tons.[a]

July-June Trade Years	Production	Utilization	Trade	Ending Stocks[b]	Stocks as % of Utilization
Projected					
1985-86	1,660	1,620	204	258	15.9
Preliminary					
1984-85	1,636	1,598	221	219	13.7
1983-84	1,483	1,554	208	181	11.6
1982-83	1,544	1,511	201	252	16.7
1981-82	1,498	1,462	210	219	15.0
1980-81	1,446	1,460	215	183	12.6
1979-80	1,423	1,447	198	197	13.6
1978-79	1,462	1,435	177	221	15.5
1976-77	1,362	1,308	158	196	15.0
1971-72	1,197	1,179	110	183	15.6
1966-67	1,007	981	104	169	17.2
1960-61	846	832	72	199	23.9

[a] Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains*, FG 10-85 (Washington, D.C.), July 1985. Includes wheat, milled rice, and coarse grains.

[b] Excludes total stocks in most communist nations due to lack of published data. Stocks are an aggregate of individual marketing years and do not reflect stocks at a single point in time.

Figure 1. Annual Change in Total World Grain Trade, 1961-62 through 1985-86 in Millions of Metric Tons.



Source: Compiled from U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains*, FG 7-85 (Washington, D.C.), May 1985.

grain importing nations as a group experienced increased domestic production, global exports rose only 13 million metric tons while consumption expanded by 44 million tons.

Short and Intermediate Term Prospects

Unusually favorable weather in Europe, India, and China contributed some to the unusually sharp rise in 1984-85 global grain production. However, record yields in these areas were partially offset by less than ideal weather in North America, USSR, and South Africa, and by a U.S. wheat Payment-In-Kind (PIK) Program to curtail wheat plantings. Also, part of the increased European, Indian, and Chinese yields reflects technological improvements including higher yielding cereal varieties, increased use of fertilizer and irrigation, and modifications in the Chinese agricultural sector to provide farm workers with monetary incentives to expand production. Taking these developments into account, normal weather in the world's major grain areas would likely permit global grain utilization to increase in the next few years at approximately a 2 percent average annual rate. That combination could also permit a modest expansion in global carryover stocks, with the exact level depending heavily on changes in U.S. agricultural policies.

Over the next several years, global grain exports also appear likely to trend gradually upward. However, with increasing competition from domestically produced grain in major importing nations, there appears to be a substantial probability that average export growth will remain considerably below the rapid expansion years of the 1970s. Global exports in 1985-86 will depend strongly on the size of the Soviet Union's 1985 crop. Since that nation was a key element in expanded 1984-85 world grain trade, sharply improved production there could temper or slightly reduce global trade in the year ahead. And with the recent change in Soviet leadership, any major shifts in its agricultural policies will also have a bearing on longer term trends in world grain exports. For more than a decade, performance of the Soviet grain sector has lagged behind other areas of the world as well as the Soviet livestock and poultry sector. It would not be surprising to see the new Soviet leaders place sharply increased emphasis on improved performance of its crop production system in the years immediately ahead.

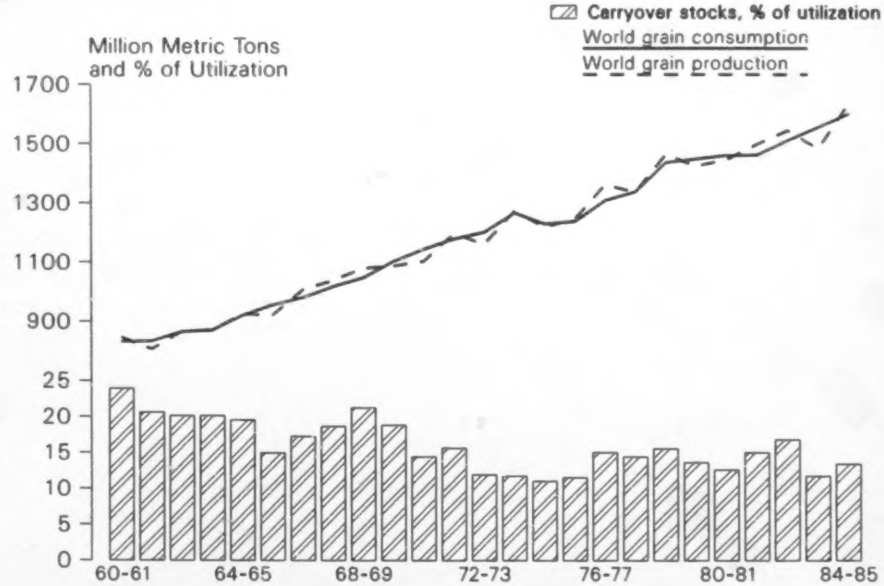
Record World Wheat Production for Fourth Consecutive Year, Stocks Rise

In a continuation of the trend since 1979-80, global 1984-85 wheat production increased more rapidly than world population. As a result, per capita supplies rose, consumption increased by 2.9 percent, and carryover stocks reached a record 109.5 million metric tons. Stocks at that level were 8.5 percent above the previous high in mid-1979 and were equivalent to 21.8 percent of annual utilization. The increase came despite a second year of the U.S. Payment-In-Kind Program that was designed to control 1984 wheat production. The large world crop reflected record or near-record production in the European Community, India, China, Australia, and Argentina along with sharply reduced production in Canada and USSR. Large global supplies and depressed prices continued to encourage substantial wheat feeding from European and Southern Hemisphere crops, although wheat feeding declined modestly in the U.S. with more plentiful coarse grain supplies and lower corn (maize) and grain sorghum prices than a year earlier.

After a slight decline in 1982-83, world wheat trade has expanded slightly for two consecutive years, but at a much slower rate than in the decade of the 1970s. Preliminary estimates place 1984-85 global wheat trade 2.6 percent above the previous year, with the increase strongly influenced by adverse weather in the Soviet Union and a resulting drop in that nation's domestic wheat supplies. U.S. wheat exports in 1984-85 increased by a smaller amount than those of major competing exporters as a group. Preliminary estimates place 1984-85 U.S. wheat exports at 38.0 million metric tons, down 2.3 percent from the previous trade year and down 22 percent from the 1981-82 record (see Table 2).

World wheat stocks continued their upward trend in 1984-85, reaching an estimated 109.5 million metric tons (excluding stocks in USSR, China, and certain other centrally planned countries) at the end of the trade year. Stocks at that level represented 21.8 percent of annual utilization or 80 days' requirements. That is still slightly below the 24 to 26 percent of annual requirements during the 1977-79 period and well below the level of the 1960s when stocks were as high as 30 to 38 percent of annual utilization.

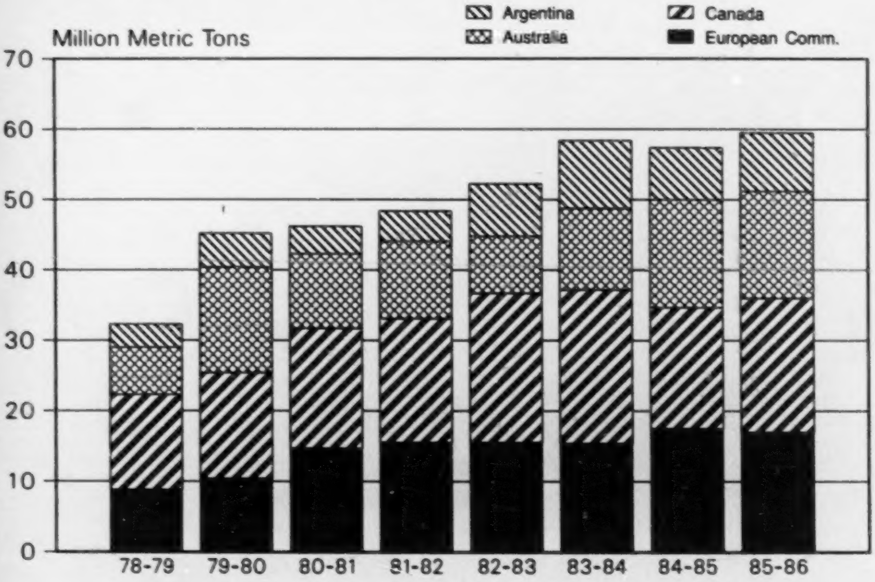
Figure 2. World Grain Production and Consumption in Millions of Metric Tons, and Carryover Stocks as Percentage of Annual Consumption, July-June 1960-61 to 1984-85.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains*, FG 7-85 (Washington, D.C.), May 1985 and various other issues.

In general, supply-demand data for the world wheat economy continue to indicate that U.S. wheat policies have been unable to significantly reduce U.S. and world carryover stocks. U.S. policies have been offset by sharply increased production in several other exporting nations and a resulting decline in the U.S. share of global wheat exports. Future trends in the U.S. wheat trade share will depend heavily on: (1) the exchange rate of the U.S. dollar relative to other currencies, (2) U.S. domestic price support and grain reserve policies, (3) the rate of adoption of new higher yielding wheat varieties in the U.S., and (4) the availability of financing for U.S. export sales and market development.

Figure 3. Wheat Exports by Major Non-U.S. Exporters, July-June 1985-86 and Comparisons with Recent Years in Millions of Metric Tons.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains*, FG 21-83 (Washington, D.C.), July 14, 1983 and FG 7-85 (Washington, D.C.), May 1985.

World Coarse Grain Supplies Up Sharply, Stocks Rise Modestly

World coarse grain production recorded one of the largest one-year increases on record in 1984-85, with total production reaching a record 804.4 million metric tons (see Table 3). That represents an increase of 17 percent or 119.3 million metric tons from the previous trade year and was 3 percent above the previous record production in 1982-83. Much of the increase reflects the expiration of the U.S. Payment-In-Kind Program in which producers received payments of grain from reserve and government-owned stocks in return for sharply reducing 1983 feed grain plantings. This program and a severe U.S. drought brought a sharp decline in 1983-84 world coarse grain production. In 1984-85, with more favorable weather and a rebound in U.S. plantings, U.S. feed grain production rose 73 percent or 100 million metric tons above the previous season's unusually low level.

World utilization of coarse grains in 1984-85 rose by an estimated 22.1 million metric tons or 3 percent, much less than the increase in production. Growth of utilization was restrained by continued strong competition from international wheat feeding and sluggish growth in world livestock production. With production rising more sharply than utilization, global coarse grain

Table 2. World Wheat Production, Utilization, Trade, and Carryover Stocks in Millions of Metric Tons in 1985-86 and Selected Recent Years.[a]

July-June Trade Years	Production	Utilization	U.S. Exports	Non-U.S. Exports	Total Trade	Ending Stocks[b]	Stocks as % of Utilization
Projected							
1985-86	514.5	505.7	32.7	64.8	97.5	118.3	23.4
Preliminary							
1984-85	513.8	502.7	38.0	67.6	105.6	109.5	21.8
1983-84	490.4	488.4	38.9	64.1	102.9	98.5	20.2
1982-83	479.1	467.8	39.9	58.7	98.6	96.4	20.6
1981-82	448.4	441.5	48.8	52.5	101.3	85.1	19.3
1980-81	442.7	445.6	41.9	52.2	94.1	78.2	17.5
1979-80	424.4	444.2	37.4	48.6	86.0	81.0	18.4
1978-79	446.8	430.2	32.3	39.7	72.0	100.9	23.9
1976-77	421.3	385.8	25.8	37.5	63.3	99.8	26.2
1971-72	350.9	344.2	16.6	35.4	52.0	81.0	23.5
1966-67	306.8	279.9	20.3	35.7	56.0	82.1	29.4
1960-61	238.4	234.8	19.6	22.4	41.9	81.8	34.8

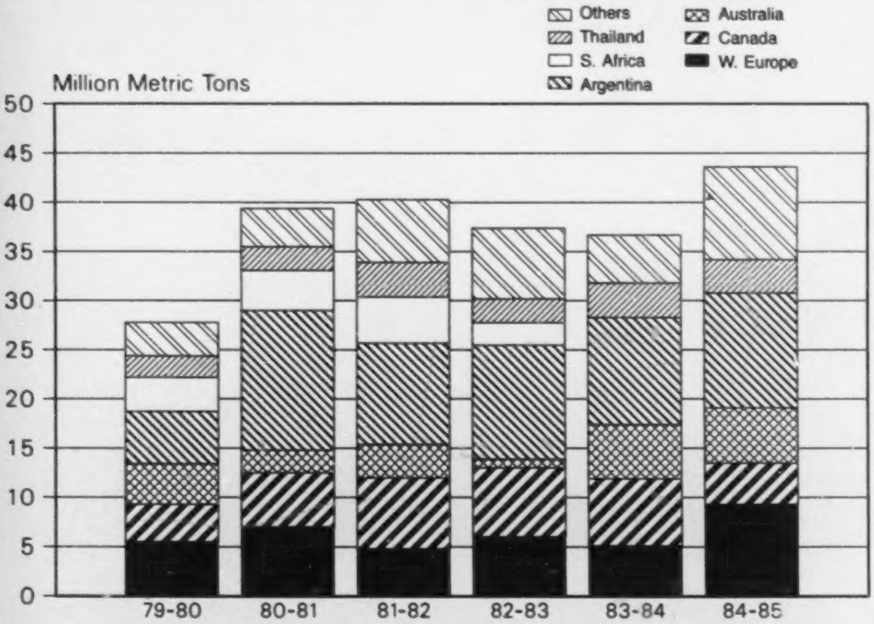
[a] Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agricultural Circular, Grains*, FG 10-85 (Washington, D.C.), July 1985. Includes wheat and wheat products.

[b] Excludes total stocks in most communist nations due to lack of published data. Stocks are an aggregate of individual marketing years and do not reflect stocks at a single point in time.

stocks resumed an upward trend that had been interrupted briefly in 1983-84 by the U.S. drought and Payment-In-Kind Program. Ending 1984-85 stocks at 88.8 million metric tons were only about two-thirds as large as the 1982-83 record and (excluding USSR, China, and certain other centrally planned nations for which stocks data are unavailable) represented a modest 11 percent of annual world utilization.

Global coarse grain trade increased modestly in 1984-85 with essentially all of the increase reflecting sharply higher Soviet grain imports to offset disappointing 1984 crop production. World trade is estimated at 103.2 million metric tons, the second highest on record but down 4 percent from the 1980-81 record. As with wheat, the U.S. share of global coarse grain exports declined in 1984-85 due to increased production by other exporting nations and a strong U.S. dollar that tended to place U.S. coarse grain exports at a competitive disadvantage. U.S. coarse grain exports in 1984-85 were the fourth largest on record and were down 16 percent from the record level of four years earlier. In contrast, non-U.S. coarse grain exports set a new record in 1984-85, reaching almost 45.0 million metric tons. That represents an increase of 17 percent from the previous record established in 1980-81. Increased non-U.S. exports reflect a growing surplus of grain in the European Community, the recent reemergence of the People's Republic of China as a corn (maize) exporter and substantial competition from Argentina.

Figure 4. Coarse Grain Exports by Major Non-U.S. Exporters, October-September 1984-85 and Comparisons with Recent Years in Millions of Metric Tons.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains*, FG 7-84 (Washington, D.C.), April 1984 and FG 7-85 (Washington, D.C.), May 1985.

Future trends in U.S. shares of world coarse grain trade as well as the total size of that market will continue to be influenced by U.S. price support policies and exchange rates of the U.S. dollar. In addition, any major policy changes in the Soviet grain sector, stemming from the recent change in that nation's leadership, will have significant implications for U.S. and world coarse grain exports. With shrinking markets elsewhere, the Soviet Union became the largest single foreign market for U.S. corn (maize) in 1984-85 and accounted for approximately one-third of all U.S. corn exports.

Table 3. World Coarse Grain Production, Utilization, Trade, and Carryover Stocks in Millions of Metric Tons in 1985-86 and Selected Recent Years.[a]

July-June Trade Years	Production	Utilization	U.S. Exports	Non-U.S. Exports	Total Trade	Ending Stocks[b]	Stocks as % of Utilization
Projected							
1985-86	825.4	795.6	51.6	43.0	94.6	118.6	14.9
Preliminary							
1984-85	804.4	780.8	58.1	45.1	103.2	88.8	11.4
1983-84	685.1	758.7	55.8	36.7	92.5	65.1	8.6
1982-83	778.8	753.0	54.0	36.2	90.2	138.7	18.4
1981-82	768.8	738.6	58.4	38.0	96.6	113.0	15.3
1980-81	732.0	742.1	69.5	38.5	108.0	82.8	11.2
1979-80	740.6	740.0	71.4	27.8	99.2	92.7	12.5
1978-79	751.7	746.0	60.2	32.5	92.7	92.2	12.4
1976-77	703.5	684.2	50.6	33.3	83.9	78.2	11.4
1971-72	629.9	616.2	24.2	25.1	49.3	87.0	14.1
1966-67	521.2	520.2	20.0	20.0	40.0	76.1	14.6
1960-61	447.9	437.2	15.7	8.3	24.0	109.7	25.1

[a] Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agricultural Circular, Grains*, (Washington, D.C.), FG 10-85 July 1985; FG 6-85, April 1985.

[b] Excludes total stocks in most communist nations due to lack of published data. Stocks are an aggregate of individual marketing years and do not reflect stocks at a single point in time.

World Rice Production, Utilization, Stocks Up Mostly

World rice production continued its long-term upward trend in 1984-85, with global output rising for the fifth consecutive year. Preliminary estimates place world milled rice production at 318.1 million metric tons—3.6 percent above a year earlier. U.S. rice production rose by 37 percent (or 4.4 million metric tons) in 1984-85 as the crop rebounded from severe 1983 drought and reduced plantings resulting from the 1983 Payment-In-Kind Program. Much of the increase reflects increased production in China, the world's leading rice producing nation, along with generally good crops elsewhere. China's production is estimated to have been about one-fourth larger than four years earlier. Indicated world production was up 17 percent from 1980-81.

World rice utilization has exhibited a remarkably stable and predictable long-term upward trend, with global utilization increasing every year except one since 1965-66. Utilization rose by 2.4 percent in 1984-85, modestly below the 3.3 percent average growth rate of the previous 11 years. Indicated aggregate world utilization was up 15.6 percent from 4 years earlier, with global utilization lagging slightly behind the upward trend of production (see Table 4).

Reported carryover stocks rose nearly four million tons in 1984-85, with these stocks representing a very modest 6.6 percent of annual utilization. That represents a slight decrease from stocks levels of the 1970s, which ranged from 7 to 11 percent of annual utilization. However, it should be noted that reported stocks exclude those of North Korea, Laos, Vietnam, and China, and consequently substantially understate global stocks. These four nations produce approximately 60 percent of the world's rice crop.[1]

The U.S. continues to be a relatively small producer of rice when compared with major rice producing countries in Asia. However, it has consistently held a second-place ranking in world exports in recent years. Thailand continues to be the world's leading rice exporter. Global rice exports have fluctuated between 11 and 13 million metric tons since the mid-1970s, with no identifiable trend (see Table 4). Exports in 1984-85 are estimated to have declined by 5.6 percent or 0.7 million metric tons from the previous year. Preliminary estimates indicate the decline was largely absorbed by Thailand and the U.S. The U.S. rice crop represents slightly over 1 percent of world production, while U.S. exports account for 17 percent of global trade. Rice importing areas include the European Community, Nigeria, Indonesia, and the Middle East.

World Oilseed Production Up Sharply

Preliminary estimates place 1984-85 world production of eight major oilseeds at a record 187.0 million metric tons, up 12.5 percent from the previous year and up 5.0 percent from the previous record in 1982-83. Like coarse grains, a significant part of the increased production can be traced to the U.S., where somewhat improved weather and expiration of the 1983 Payment-In-Kind Program generated increased soybean and cottonseed production. Larger world production also reflected favorable weather in the European Community, China, and South America and expanded soybean and sunflowerseed plantings in the latter area, as well as expanded production in the palm-growing areas of Malaysia. Increased world production, along with sluggish growth in world livestock numbers, depressed livestock feeding profits in some areas. Increased wheat feeding resulted in ample protein meal supplies and the lowest protein meal prices in nearly a decade (when expressed in current U.S. dollars per ton). Wheat feeding contributed to sluggish demand for protein meal because its protein content usually is higher than that of coarse grains. Thus, properly balanced rations utilizing wheat require less protein meal than would be the case with rations based more heavily on corn (maize) or grain sorghum.

World protein meal production rose by a slightly greater percentage than fat and oil production in 1984-85. As shown in Table 5, production of major protein meals on a 44 percent protein basis increased approximately 6.8 percent from a year earlier and was 13.3 percent above the level of four years ago. Production of major fats and oils, on the other hand, rose only 5.8 percent above a year earlier. With relatively low visible and invisible (or unreported) world fat and oil stocks, world vegetable oil prices remained near year-earlier levels and

Table 4. World Milled Rice Production, Utilization, Trade, and Carryover Stocks in Millions of Metric Tons in 1985-86 and Selected Recent Years.[a]

July-June Trade Years	Production	Utilization	U.S. Exports[b]	Non-U.S. Exports[b]	Total Trade[b]	Ending Stocks[c]	Stocks as % of Utilization
Projected							
1985-86	319.7	318.9	1.9	9.9	11.8	21.4	6.7
Preliminary							
1984-85	318.1	314.8	2.0	9.8	11.8	20.6	6.6
1983-84	307.1	307.4	2.1	10.4	12.5	16.9	5.4
1982-83	285.5	289.5	2.3	9.6	11.9	17.3	6.0
1981-82	280.6	281.4	2.5	9.1	11.6	21.3	7.6
1980-81	271.0	272.3	3.0	10.1	13.1	22.1	8.1
1979-80	258.1	262.6	3.0	9.7	12.7	23.3	8.9
1978-79	263.7	258.6	2.3	9.7	12.0	27.8	10.8
1976-77	236.8	238.4	2.1	8.5	10.6	17.7	7.4
1971-72	216.4	218.8	1.8	6.9	8.7	15.3	7.0
1966-67	179.3	180.7	1.7	6.1	7.8	10.6	5.9
1961-62	147.3	147.7	0.9	5.4	6.3	7.0	4.7

[a] Source: U.S. Department of Agriculture, Foreign Agriculture Service, *Foreign Agricultural Circular, Grains*, (Washington, D.C.), FG 9-84, June 1984; FG 10-85, July 1985.

[b] Exports are computed on a calendar year basis.

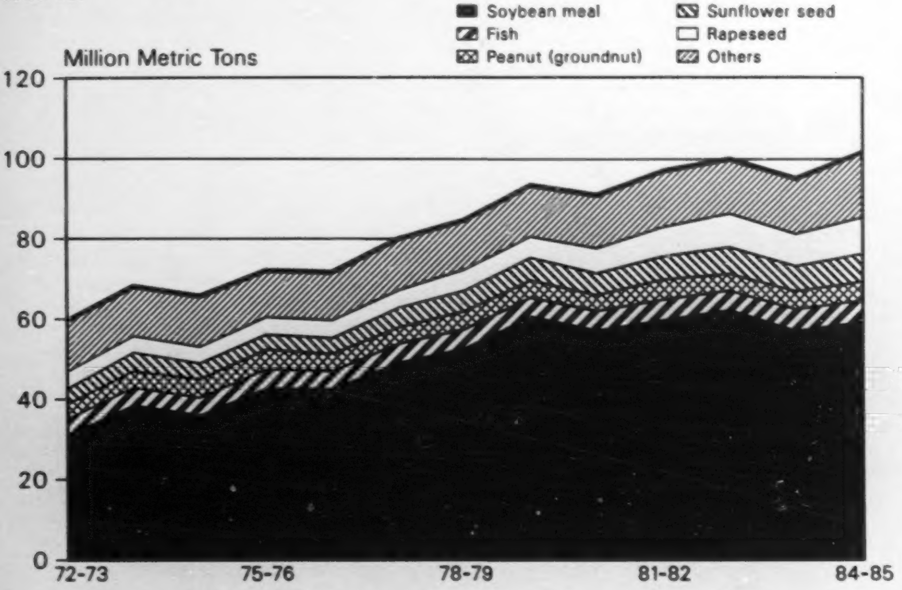
[c] Excludes total stocks in most communist nations due to lack of published data. Stocks are an aggregate of individual marketing years and do not reflect stocks at a single point in time.

Table 5. World, U.S., and Foreign Production of Oilseed Products and Fats in 1972-73, 1979-80, 1982-83, and 1984-85 in Millions of Metric Tons.[a]

	44% Protein Meal Equivalent						Fat and Oil Production					
	1972-73	1979-80	1982-83	1983-84	1984-85	% Change 1972-85	1972-73	1979-80	1982-83	1983-84	1984-85	% Change 1972-85
U.S.	17.8	27.3	27.0	22.8	24.8	+39	7.8	10.4	10.5	9.6	9.9	+27
Non-U.S.	35.6	58.8	69.0	68.6	72.8	+104	30.6	41.6	46.8	47.1	50.0	+64
World Total	53.4	86.1	96.0	91.4	97.6	+83	38.4	52.0	57.3	56.7	60.0	+56

[a] Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Oil Seeds and Products*, (Washington, D.C.), FOP 4-85, April 1985; FOP 25-77, December 1977; and personal communication with USDA officials.

Figure 5. World Protein Meal Production by Type of Product, 1972-73 through 1984-85.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Oilseeds and Products*, FOP 5-85 (Washington, D.C.), May 1985 and personal communications with officials of U.S. Department of Agriculture *Foreign Agriculture Circular*.

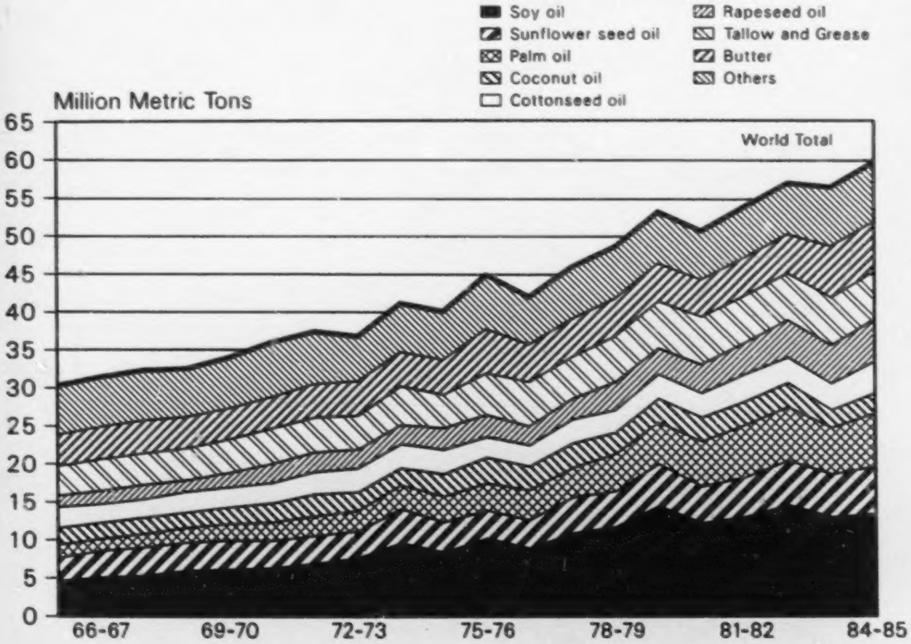
sharply above those of the late 1970s and early 1980s. One reason for the disparity of oil and meal production trends is that much of this season's growth in oilseed production is concentrated in soybeans and cottonseed. These oilseeds have a higher protein meal yield per ton and lower oil content than many competing oilseeds.

Global stocks of oilseeds are expected to be moderately above a year earlier by late summer 1985, with preliminary projections showing approximately a three million ton increase from the previous year. At that level, stocks will be equivalent to 12 percent of annual utilization, down from 15 percent in 1980-81. Stocks of major vegetable and fish oils at the end of 1984-85 are expected to be 7.9 percent of annual consumption—about the same as in 1983-84 but down from 10.9 percent four years earlier. Global protein meal stocks are projected to rise to 4.6 percent of annual utilization by the end of the 1984-85 trade year, and rise to 4.6 percent of annual utilization by the end of the 1984-85 trade year, up from 4.3 percent of utilization the previous year and 4.4 percent in 1980-81.

Early indications point to some easing of tight world vegetable oil supplies in 1985-86 with increased palm oil production in Malaysia and large South American crops harvested in March through May, 1985. However, favorable weather in the major Northern Hemisphere soybean, sunflowerseed, rapeseed, and cottonseed growing areas also will be needed in 1985 to avoid continued tight fat and oil supplies in the year ahead.

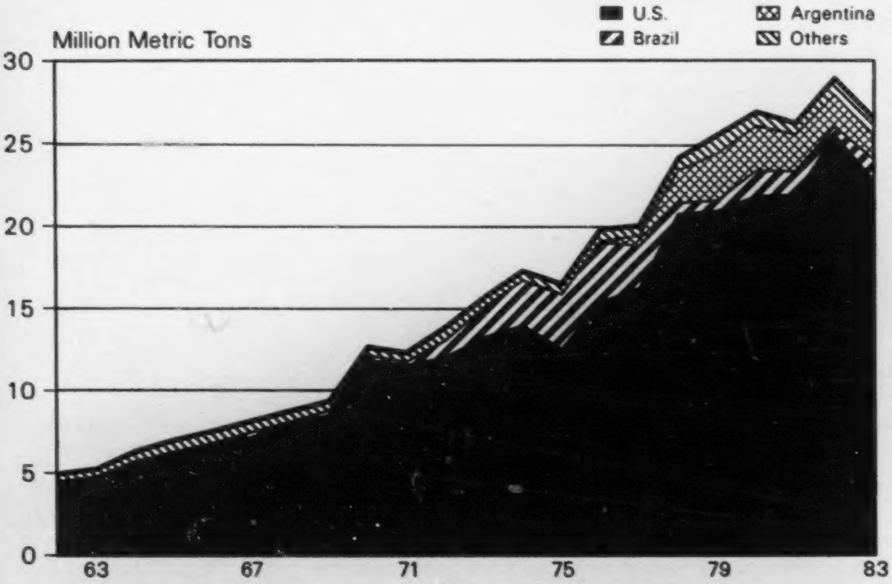
As Figure 5 indicates, soybean meal has been the major source of increased world protein meal production over the last 12 year period and that same pattern continued with the expanded 1984-85 production. Growth in world soybean production to support expanded protein meal output during the past two decades has come primarily from U.S., Brazil, and

Figure 6. World Fat and Oil Production by Type of Product, 1965-66 through 1984-85.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Oilseeds and Products*, FOP 4-84 (Washington, D.C.), April 1984 and various other issues.

Figure 7. World Soybean Exports by Country of Origin, Calendar Years 1962 to 1983.



Source: Food and Agriculture Organization of the United Nations, *Trade Yearbook* (Rome, Italy), various issues.

Argentina. As shown in Figure 6, soybean oil represents a much less dominant portion of world fat and oil production than in the meal side of the complex (see Figure 5). In the past two decades, the expansion in soybean oil production has been much greater than that for any other individual fat or vegetable oil. However, expanded output of sunflowerseed, palm and rapeseed oil, and butter as a group has sharply exceeded growth in soybean oil production. With competition from numerous other fats and oils, soybean oil represents only about one-fifth of the total world fat and oil supply. In contrast, soybean meal represents about 60 percent of the global production of major protein meals.

In the years immediately ahead, soybean meal is likely to continue playing a leading role in meeting growth in world demand for protein meal. One reason for this is the much higher meal yield per ton of soybeans than most other major oilseeds. Recent tree plantings in Malaysia suggest that nation's palm oil production will play a key role in meeting future world growth in demand for fats and oils along with some long-term growth in soybean oil production.[2]

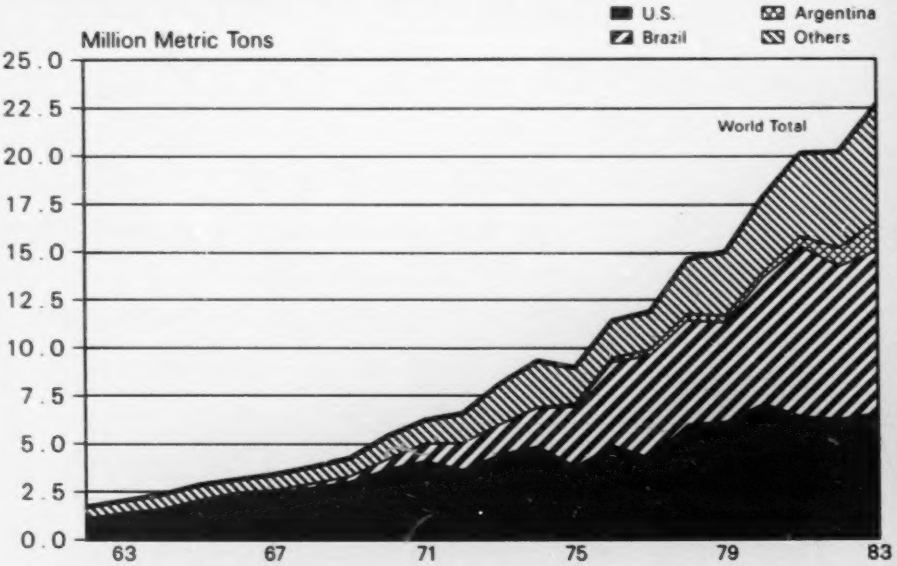
Most of the world's soybean production comes from four countries—the United States, China, Brazil, and Argentina. As indicated in Figure 7, the U.S. has been the leading soybean exporting nation for many years and continues to retain that position. During the 1970s, Brazil briefly emerged as a significant exporter. However, its government policies have encouraged exports of processed products rather than soybeans; as a result, Brazilian exports of unprocessed soybeans are well below those of the mid-1970s. However, Argentina has sharply increased its soybean production since the mid-1970s and is now an important competitor of the U.S. in world soybean markets. In recent years, most of China's soybean crop has been used domestically, with its exports normally being quite small.

In contrast to soybeans, Figures 8 and 9 indicate the U.S. is much less dominant in exports of soybean cake and oil than of unprocessed soybeans. Major non-U.S. cake and oil exporters are Brazil and the European Community (included in the "Others" category). European Community (EC) cake exports are almost entirely produced from soybeans grown in the U.S., Argentina, and Brazil. The EC has very little domestic soybean production because of climatic limitations. The EC policies encourage imports of soybeans for processing partly by means of a modest import duty on soybean oil. With substantial excess soybean processing capacity in Brazil, that nation appears almost certain to remain a major element in world soybean meal and oil trade in the years ahead. Future shifts in EC soybean processing will be dependent on its trade policies. Barring major policy changes, the EC appears likely to continue as a major competitor of U.S. soybean processors in the years ahead.

Trends in World Grain Area Harvested

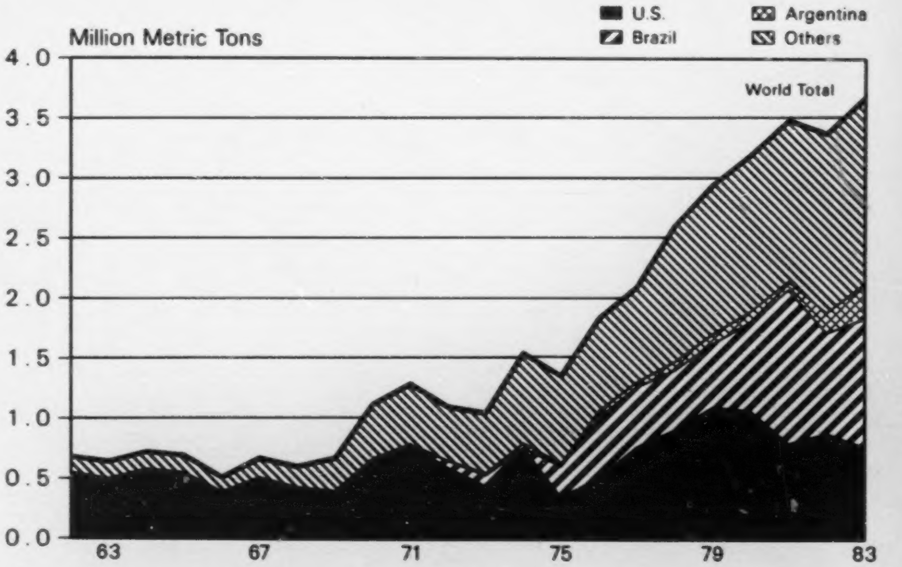
World wheat, coarse grain, and rice area harvested trended slowly upward during the past several decades until 1983-84, with more intensive cropping practices in several areas (see Figure 10). In the U.S., much of the land formerly idled under government farm programs was returned to production in the 1970s, some land has been converted from pasture and forage to grain and oilseed production, woodlands were cleared and low lands drained in some areas, irrigation reduced the need for summer fallow and converted arid lands to productive cropland. Similar adjustments have occurred in other developed and developing nations. And in South America, land clearing in Brazil has expanded that nation's cropland substantially in the last 15 years. While year-to-year changes in the world's cropland base as a result of such adjustments are small, the impact over a 10- to 20-year period has been significant and has contributed to the upward trend in global food production.

Figure 8. World Soybean Cake Exports by Country of Origin, Calendar Years 1962 to 1983.



Source: Food and Agriculture Organization of the United Nations, *Trade Yearbook* (Rome, Italy), various issues.

Figure 9. World Soybean Oil Exports by Country of Origin, Calendar Years 1962 to 1983.



Source: Food and Agriculture Organization of the United Nations, *Trade Yearbook* (Rome, Italy), various issues.

World Coarse Grain Area Up Sharply in 1984-85

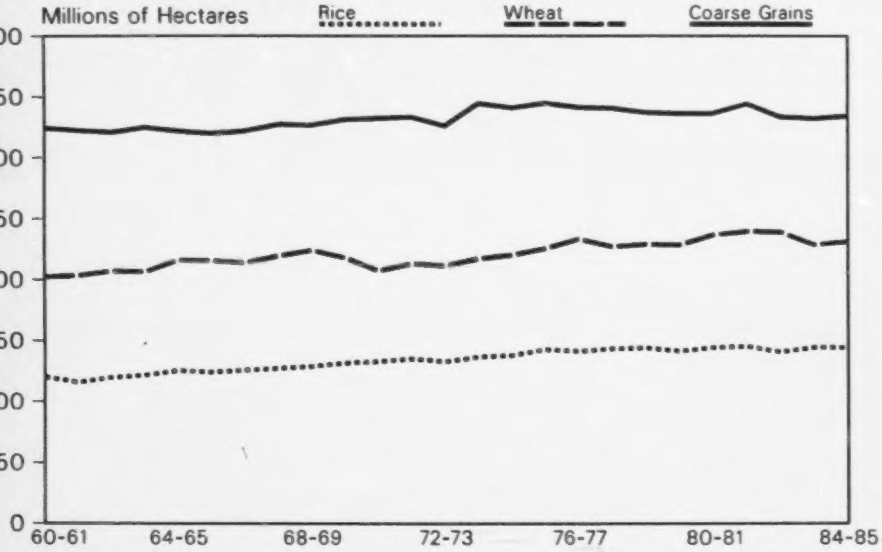
World coarse grain area expanded substantially in 1984-85 after a decline the previous year. In the 1983-84 crop production year, coarse grain harvested area in major producing nations had declined by 5.5 percent. That was the largest one-year decline in decades if not a record decline (see Table 6). Reduced coarse grain area occurred in three regions: U.S., Canada, and Western Europe. By far the largest decline was in the U.S., where the government Payment-In-Kind Program (PIK) was used to reduce plantings and U.S. coarse grain carryover stocks.

Farmers in Western Europe and Canada also reduced coarse grain plantings slightly as they responded to what were perceived as greater profit opportunities in wheat and oilseed production. In total, non-U.S. coarse grain area in major producing nations expanded by 2.3 percent in 1983-84 while U.S. area declined by 25 percent. In 1984-85 as the U.S. Payment-In-Kind Program was withdrawn, U.S. coarse grain area rebounded to approximately the same level as in 1982-83. With increased plantings in Canada, Australia, and USSR, coarse grain area in major producing nations moved 0.4 percent above pre-PIK levels. Tentative projections indicate 1985-86 global area harvested will be approximately the same as the previous year.

From a longer-term perspective, coarse grain area harvested in major producing nations in 1984-85 was 13 percent above 15 years earlier and up 0.6 percent from 10 years ago. The U.S. area harvested was up 10 percent from a decade and a half earlier, and there was a 15 percent increase in the major non-U.S. coarse grain producing nations.

World coarse grain area harvested may trend slowly upward in the decade ahead with a continuation of long-term trends in land utilization. The greatest potential for expanded plantings appears to be in South America, where additional Argentine pastureland may be converted to grain production and Brazilian land clearing operations are likely to continue. With favorable economic conditions, some additional land also could be cleared and drained for crop production in the U.S.[3] However, such land is unlikely to be brought into crop production in significant quantities until profit margins in crop production increase from recent depressed levels. The Soviet Union also has some additional land that could be brought into crop production through irrigation or drainage. Whether or not such land is utilized will depend on the priority placed on agriculture by the new Soviet leadership, and the cost and availability of imported grain.

Figure 10. World Harvested Area Devoted to Individual Grains in Millions of Hectares, 1960-61 through 1984-85.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains*, FG 6-85 (Washington, D.C.), April 1985.

Table 6. Wheat and Coarse Grain Area Harvested in Millions of Hectares in Major Producing Countries, 1984-85 and Comparisons with Recent Years.[a]

	Coarse Grains						Wheat					
Area or Country	1970-71	1975-76	1981-82	1982-83	1983-84	Prelim. 1984-85	1970-71	1975-76	1981-82	1982-83	1983-84	Prelim. 1984-85
W. Europe	24.0	25.2	24.4	24.1	23.2	23.4	17.0	15.4	16.4	16.9	17.1	17.1
Canada	8.4	8.6	9.2	8.9	7.8	8.0	5.1	9.1	12.4	12.6	13.7	13.2
Australia	4.3	3.9	4.8	4.5	5.8	5.8	6.5[b]	8.6[b]	11.9[b]	11.5	12.9	12.2
Argentina	7.5	5.9	6.4	6.3	6.2	6.1	3.7	5.3	5.9	7.3	6.9	5.9
S. Africa	5.5	5.6	5.3	4.8	4.8	4.8	1.9[b]	1.8[b]	1.8[b]	2.0	1.8	1.9
U.S.S.R.	43.9	58.1	58.0	58.0	61.2	59.2	65.2	62.0	59.2	57.3	50.8	51.1
Total above	93.6	107.3	108.1	106.6	109.0	107.3	99.4	102.2	107.6	107.6	103.1	101.4
U.S.	39.7	42.6	43.6	43.6	32.9	43.5	17.7	28.1	32.8	32.0	24.8	27.1
Total	133.3	149.9	151.7	150.2	141.9	150.8	117.1	130.3	140.4	139.6	127.9	128.5

[a] Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains*, (Washington, D.C.), FG 13-82, April 26, 1982; FG 16-75, December 22. 1975; FG 7-77, July 1977; WCP 4-85, April 11, 1985; FG 10-74, April 1974; and personal communication with officials of U.S. Department of Agriculture, Foreign Agricultural Service.

[b] Planted area.

Europe, Canada, Australia Expand Wheat Area

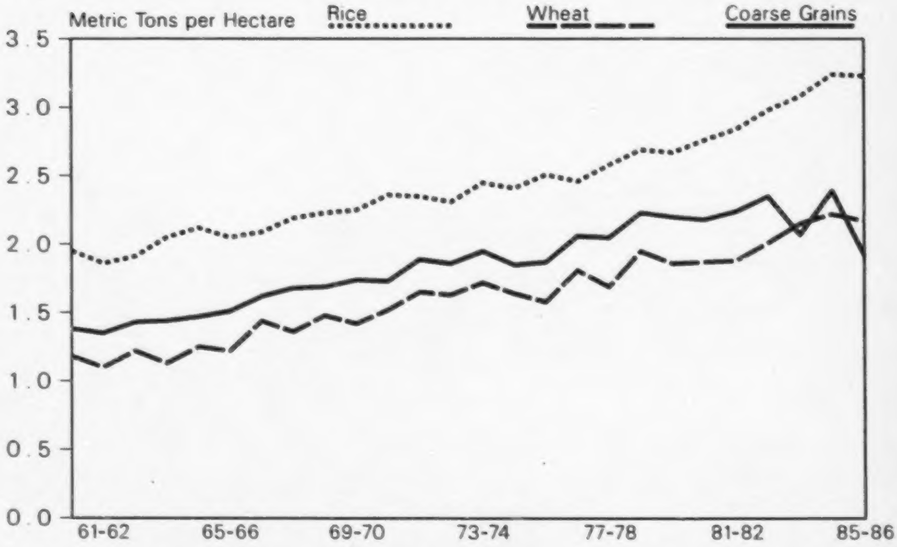
The U.S. PIK Program reduced U.S. wheat area harvested in 1983-84 by 23 percent as farmers received government grain in return for reducing their plantings and were allowed to graze or harvest previously planted wheat as hay. However, three regions—Canada, Australia, and Western Europe—expanded their wheat areas that year and continued planting at or near the higher level in 1984-85. Thus, the U.S. PIK Program for wheat was partially offset as non-U.S. producers sought to take advantage of an expected tightening of world supplies. While U.S. wheat area fell nearly by one-fourth as a result of the PIK Program, total area of major wheat growing nations declined by only 8 percent. Unlike coarse grain, the U.S. PIK Program remained in effect in 1984-85 because of continuing large U.S. and world wheat supplies. Slightly less area was idled under the program than in 1983-84, so that 1984-85 U.S. and world wheat area rose slightly above a year earlier (see Table 6).

Longer-term trends indicate total 1984-85 wheat area harvested in major producing nations was 10 percent above a decade and a half earlier but down 8 percent from peak 1981-82 level. U.S. wheat area harvested was 53 percent larger than 15 years earlier, while the harvested area of major non-U.S. wheat producers increased only 2 percent during the same period. Non-U.S. area in 1984-85, however, would have been much further above 1970-71 levels except for the unusually low USSR harvested wheat area. Non-U.S. wheat producing nations that sharply expanded harvested area in the 1970s and early 1980s included Canada, Argentina, and Australia.

Rice Area Continues Long-term Upward Trend

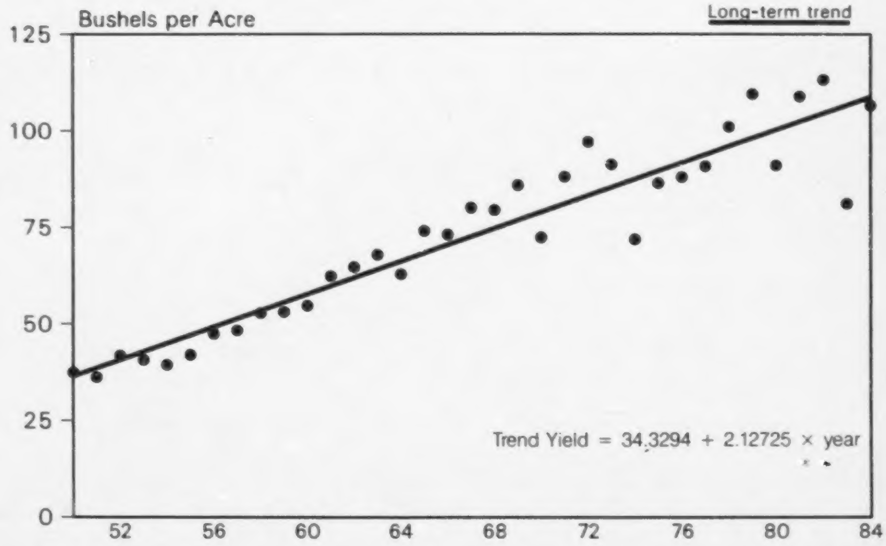
World rice area harvested continued its long-term upward trend in 1984-85 with slightly less than a 0.1 percent increase over the previous season (see Figure 10). Preliminary estimates place global area at 0.2 percent less than the record 1981-82 level but 9 percent above a decade and a half ago. As with other grains, U.S. rice area increased sharply in 1984-85 due to changes in farm programs.

Figure 11. World Grain Yields in Metric Tons per Hectare, 1960-61 through 1985-86.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains*, FG 8-84 (Washington, D.C.), May 1984.

Figure 12. U.S. Corn Yields in Bushels per Acre, 1950-84.



Source: U.S. Department of Agriculture, Statistical Reporting Service, Crop Reporting Board, *Crop Production 1984 Summary* crpr 2-1 (85), (Washington, D.C.), January 1985; *Field Crops* Statistical Bulletin No. 708, and various other issues.

Trends in Global Grain Yields

In the past two and one-half decades as shown in Figure 11, world grain yields per hectare have shown an irregular long-term upward trend. During this period, global rice yields have increased approximately 62 percent along with an 85 percent increase for wheat and a 70 percent increase for coarse grains. Drought in the U.S. and South Africa was largely responsible for the sharp trend downward in the world average coarse grain yields in 1983-84, along with moderate yield reductions in parts of Europe. In 1984-85, the global average coarse grain yield increased sharply from a year earlier with improved weather in these areas, and was approximately in line with the long-term upward trend of yields.

Wheat and rice yields have been increasing at a slightly accelerated rate in recent years with the spread of higher-yielding hybrid varieties, increased use of fertilizer, expanded use of irrigation in some areas, and other technological innovations. With favorable weather, a continued upward trend in global average yields appears likely during the next several years. The upward trend appears likely to be generated by increased applications of existing yield-improving technology as well as by an ongoing gradual development of improved varieties, better management, improved cultural practices, and other technological developments.

Figure 12 shows the long-term upward trend in U.S. corn (maize) yields from 1950 through 1984. During this period, yields have increased at an average rate of slightly over two bushels per acre (.13 metric tons per hectare) per year, and the upward trend appears to be continuing in the mid-1980s. Figure 12, however, does show an increased year-to-year variability of U.S. corn yields in the 1970s and 1980s when compared with the previous two decades. Greater variability of yields in recent years is believed to be due to increased year-to-year fluctuations in temperatures and rainfall in the U.S. cornbelt, rather than to characteristics of current corn production technology.

Trends in Soybean and Oilseed Area and Yields

After declining modestly in 1983-84 due to indirect effects of the U.S. Payment-In-Kind Program, global soybean area harvested in 1984-85 resumed its long-term upward trend. Total area harvested in the countries shown in Table 8 rose 4.4 percent above a year earlier but remained slightly below the 1982-83 record. Plantings in nearly all major producing nations rose slightly above the previous season.

Aggregate world harvested area and yields of major oilseeds including flaxseed, sunflowerseed, rapeseed, peanuts (groundnuts), and cottonseed are shown in Figure 13, along with area devoted to individual crops in Figure 14 and yields in Figure 15. Global cottonseed area has remained relatively stable since the late 1970s, while area devoted to rapeseed and sunflowerseed has increased modestly with increased plantings in Canada, parts of Europe, Argentina, and China. Harvested area of peanuts and flaxseed exhibited a slight downward trend during the same time period. Figure 15 shows yield trends for these same oilseed crops since 1972-73. Except for flaxseed, yields of most major oilseed crops have trended upward during this time period.

Table 7. Comparative Yields in Metric Tons per Hectare of Selected Grain Producing Countries.[a]

	Coarse Grains					Wheat				
	1979-80	1981-82	1982-83	Prelim. 1983-84	Proj. 1984-85	1979-80	1981-82	1982-83	Prelim. 1983-84	Proj. 1984-85
U.S.	5.71	5.71	5.80	4.17	5.45	2.30	2.32	2.39	2.65	2.61
Canada	2.63	2.83	3.0	2.70	2.74	1.64	2.00	2.13	1.94	1.61
Argentina	2.20	2.88	2.86	2.83	3.16	1.69	1.41	2.05	1.79	2.24
Brazil	1.73	1.71	1.74	1.65	1.66	0.75	1.15	.65	1.11	1.00
Australia	1.47	1.37	.87	1.62	1.45	1.45	1.38	.77	1.69	1.52
World	2.17	2.20	2.34	2.08	2.40	1.85	1.87	2.01	2.13	2.22

[a] Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, World Crop Production*, (Washington, D.C.), WCP 4-82, April 12, 1982; WCP 3-84, March 9, 1984; WCP 4-85, April 11, 1985; *Oil Seeds and Products*, FOP 5-83 (Washington, D.C.), May 1983; and personal communication with officials of the U.S. Department of Agriculture, Foreign Agricultural Service.

Table 8. Soybean Area Harvested in Millions of Hectares in Major Producing Countries, 1984-85 and Comparisons with Recent Years.[a]

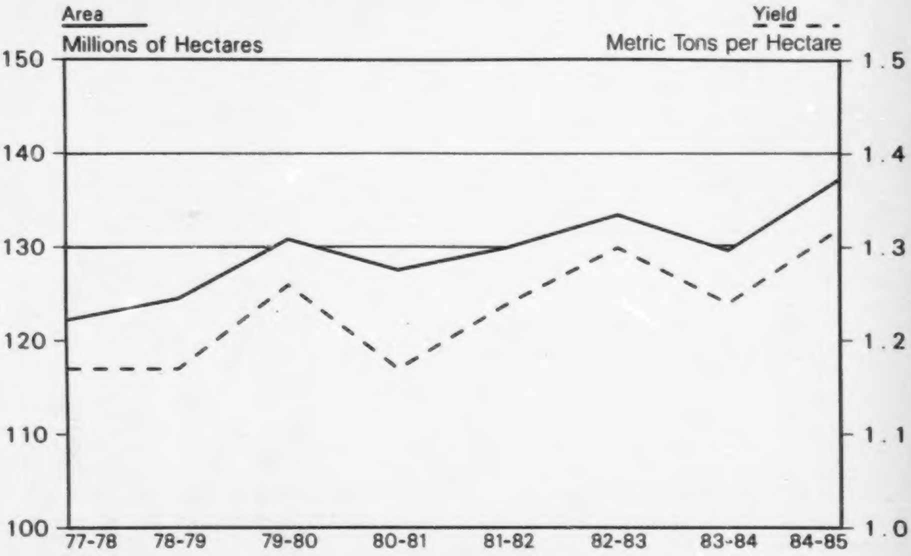
	1970-71	1975-76	1978-79	1979-80	1981-82	1982-83	Prelim. 1983-84	Proj. 1984-85	Percent Change from 1970-71 to 1984-85
U.S.	16.7	20.8	23.4	28.6	26.9	28.3	25.3	26.8	+ 60
Brazil	1.3	5.8	7.8	8.8	8.3	8.2	9.3	9.4	+ 623
Argentina	.03	0.4	1.3	2.0	2.0	2.1	2.8	3.0	+ 9,900
China	8.0	8.8	6.8	7.3	8.0	8.4	7.6	7.7	− 3.8
Canada	.1	0.2	0.2	0.3	0.4	0.4	.4	.4	+ 300
Paraguay	0.4	0.2	0.3	0.4	0.4	0.4	.4	.5	+ 11,500
Total	26.17	36.2	39.8	47.4	46.0	48.2	45.8	47.8	+ 93

[a] Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, World Crop Production*, (Washington, D.C.), WCP 6-82, May 10, 1982; WCP 4-85, April 11, 1985; *Foreign Agriculture Circular, Oilseeds and Products*, (Washington, D.C.), FOP 4-83, April, 1983; FOP 4-84, April 1984; and personal communication with officials of U.S. Department of Agriculture, Foreign Agricultural Service.

Longer Term Upward Trends in Soybean Area

From a longer term perspective, U.S. soybean area was 60 percent above the level of 15 years earlier, along with much larger percentage increases in Canada and South American soybean producing nations. World area devoted to major oilseeds, as shown in Figure 13, rose to a record 136.9 million hectares, nearly 6 percent above the previous year. The average yield per hectare also recovered from a sharp decline in 1983-84 because of increased yields in several major soybean, cottonseed, rapeseed, and sunflowerseed producing nations.

Figure 13. World Yields in Metric Tons per Hectare, and Harvested Area Devoted to Major Oilseeds, 1977-78 through 1984-85.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Oilseeds and Products*, FOP 5-85 (Washington, D.C.), May 1985.

Government Programs and Changing U.S. Soybean Cropping Patterns

Early indications point to another pause in the upward trend of soybean and oilseed area harvested in 1985-86, largely because of developments in U.S. agriculture. The strong U.S. dollar, global debt burdens, slow economic growth in several nations, and other factors have severely depressed the non-U.S. demand for protein meal. With U.S. exports of soybean meal and soybeans sharply below previous highs reached in the early 1980s, protein meal prices had fallen to the lowest U.S. dollar price in a decade as American farmers began spring 1985 soybean plantings. Prices at that level do not include adjustments for inflation, so real U.S. protein meal prices were even lower. Temporarily tight world vegetable oil supplies had pushed soybean oil prices well above the average of recent years. However, soybeans are a relatively low oil content oilseed. Soybean oil content averages about 18 percent while oil contents are 40 percent or more for sunflowerseed and several other oilseed crops.[4] Thus, strong soybean oil prices were insufficient to offset depressed protein meal prices. As a result, soybean prices in U.S. dollars during the Northern Hemisphere planting season were much lower than normal relative to competing crops.

In addition, major U.S. competing crops have more attractive government price support levels—including a target price system not available to soybeans. The U.S. soybean price support system consists only of a government loan rate of $5.02 per bushel. With the loan program, a producer may place soybeans in storage and receive a government loan at the price support level (or loan rate). The loan matures in nine months. In the meantime, the farmer may repay the loan plus interest and sell the soybeans if prices are high enough to do so. If prices are too low to cover the loan and accumulated interest at the end of nine months, the farmer may forfeit the soybeans to the government in fulfillment of loan and interest obligations. This is the price support mechanism currently available to U.S. soybean growers, although major changes are being proposed for 1986 and future years.

In contrast, corn, the largest competitor of soybeans for cropland, has a government loan rate of $2.55 per bushel on the 1985 crop and a target price of $3.03 per bushel. If prices paid to farmers from October through February average less than $3.03 per bushel, farmers enrolled in the government program will receive a deficiency payment equal to the difference between the market price and the $3.03 target price—up to a maximum of 48 cents per bushel. The deficiency payment is made on normal yields on the farmer's actual planted area of corn. To qualify for deficiency payments, farmers are required to idle 10 percent of their corn base area. Their base is equal to combined area devoted to corn and idled under the government farm program during the previous two or three years. In most cases, farmers idle their least productive land including end rows, poorly drained areas or sandy spots that dry out quickly in the summer, and steeper sloping land with erosion hazards. Productivity of the idled land often is well below the average for the entire farm, so that its total production is reduced by substantially less than 10 percent. Similar programs are available for sorghum and other crops that compete with soybeans.

In the U.S. cornbelt, a soybean/corn price ratio of approximately 2.4 typically has been needed to make corn and soybeans equally competitive for cropland. But a much lower ratio of 1.66 is reflected in the price support levels for the two crops. With depressed U.S. prices for both crops, U.S. soybean planting patterns have been influenced by the relatively higher price support levels for corn and grain sorghum. This has affected plantings in two ways. First, U.S. farmers have a strong incentive to plant as much corn and grain sorghum as possible, while still meeting government program requirements and qualifying for deficiency payments. In some previous years including 1984, strong soybean prices encouraged producers to plant less than their maximum allowable corn and sorghum area, and to devote additional area to soybeans. Second, farmers in nontraditional corn growing areas such as the southeastern and south central U.S. have an incentive to rapidly expand sorghum and/or corn area planted—in order to establish a base area that will enable them to qualify for government deficiency payments in future years.

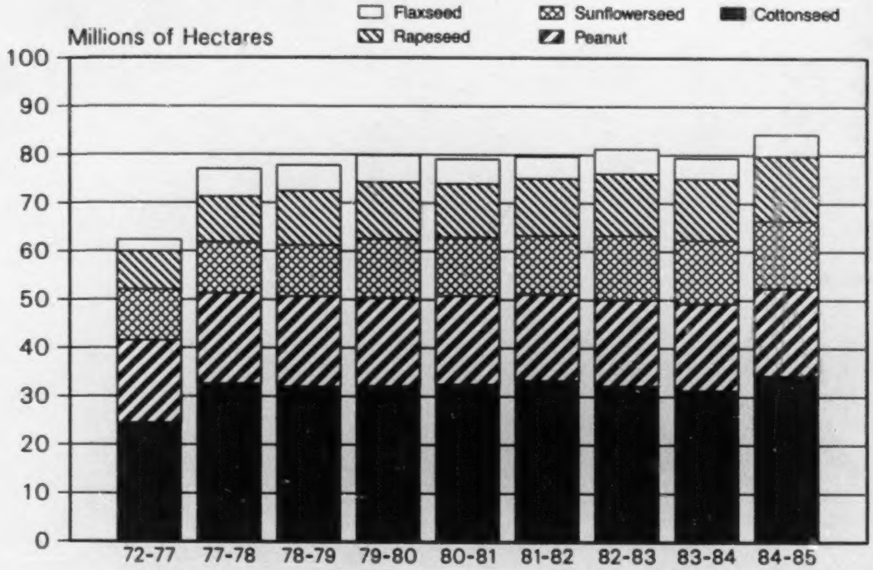
The adjustment in U.S. soybean area planted in 1985 thus is being caused by: (1) relatively low U.S. support prices for soybeans versus other competing crops, (2) a strong U.S. dollar that has depressed soybean prices paid to U.S. producers more than those of other nations, and (3) tight global vegetable oil supplies that favor increased plantings of high oil content crops rather than high protein content crops such as soybeans. Reduced 1985 U.S. soybean plantings will likely be partially offset by increased oilseed plantings in Europe, South America, and possibly in other areas.

Future Trends in Global Soybean and Oilseed Area and Yields

Trends in global soybean area planted in the years immediately ahead will depend heavily on the speed of recovery in foreign protein meal demand. That in turn will be influenced by the strength of the U.S. dollar, global economic growth and its impact on per capita meat consumption, and future trends in world wheat feeding. Since wheat has a higher protein content than coarse grains, increased wheat feeding tends to depress the demand for soybean meal, with resulting price signals tending to restrain soybean plantings. The most likely pattern appears to be a modest upward trend in world economic growth, a leveling off or modest decline in the exchange rate of the U.S. dollar relative to other currencies, slower growth of wheat feeding due to adjustments in U.S. support programs to make coarse grains more price competitive, and a resumption of a gradual upward trend in global soybean and oilseed area harvested. Yields appear likely to follow the long-term upward trend shown in Figure 13 as currently available technology becomes more widely used in both U.S. and foreign oilseed producing areas and as new technologies emerge.

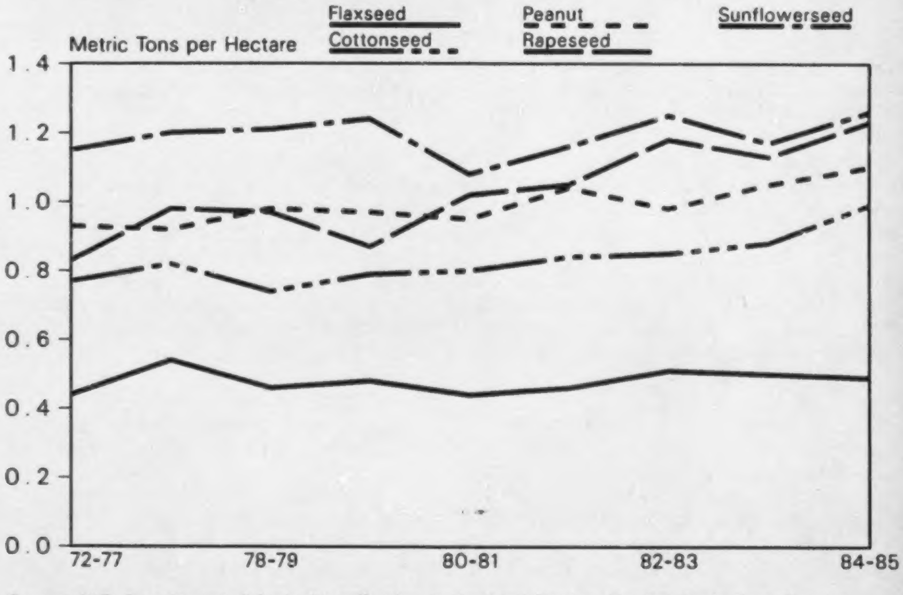
Figure 16 shows the long-term trend in the U.S. average soybean yield per acre. While yields have gradually increased over time, the upward trend has been less pronounced than in corn for several reasons. So far, production of hybrid soybeans has not been commercially feasible. Many growers also find that soybeans require a more complicated package of management practices for top yields than is the case with corn. Included here are such things as row spacing, variety selection, timing of planting and harvesting operations, disease and weed control, tillage practices, and

Figure 14. World Area Harvested in Millions of Hectares of Selected Oilseeds, 1972-77 Average and 1977-78 through 1984-85.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Oilseeds and Products*, FOP 5-85 (Washington, D.C.), May 1985 and various other issues.

Figure 15. World Yields in Metric Tons per Hectare of Selected Oilseeds, 1972-77 Average and 1977-78 through 1984-85.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Oilseeds and Products*, FOP 5-85 (Washington, D.C.), May 1985 and various other issues.

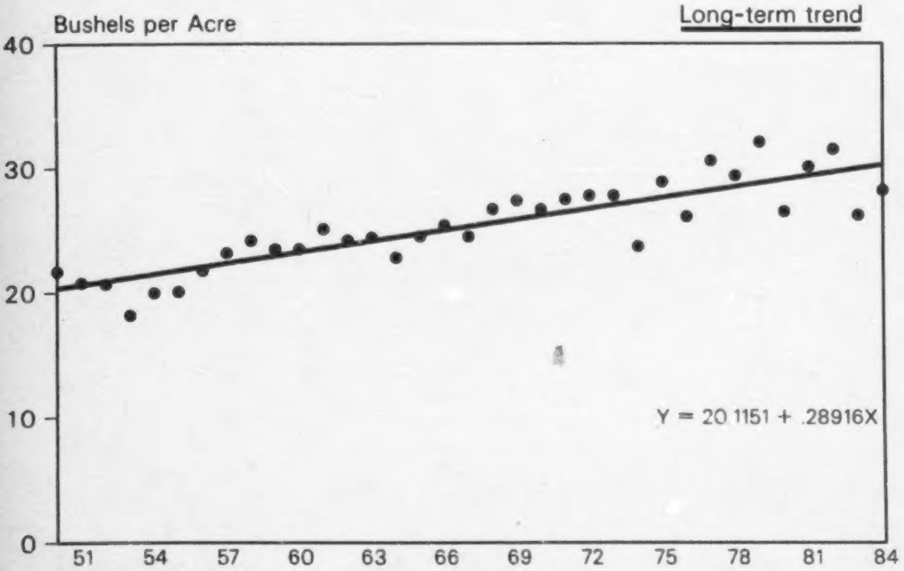
harvest machinery adjustments to minimize field losses. Despite the complicated production technology, U.S. soybean yields have shown an upward trend increase of approximately 0.3 bushels per acre (.02 metric tons per hectare) over the past three and one-half decades. Given favorable weather, this trend appears likely to continue through at least the early 1990s.

Table 9. Comparative Yields in Metric Tons per Hectare of Selected Soybean Producing Countries.[a]

	1975-76	1979-80	1981-82	1982-83	Prelim. 1983-84	Proj. 1984-85
U.S.	1.94	2.16	2.03	2.15	1.76	1.89
Canada	2.32	2.37	2.18	2.35	1.98	2.24
Argentina	1.60	1.80	2.09	2.09	2.40	2.24
Brazil	1.72	1.73	1.56	1.56	1.63	1.66
Australia	1.73	1.83	1.67	1.67	1.85	1.50
World	1.65	1.82	1.73	1.73	1.63	1.71

[a]Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Oilseeds and Products,* (Washington, D.C.), FOP 4-78, April 1978; FOP 5-83, May 1983; *Foreign Agriculture Circular. World Crop Production,* (Washington, D.C.), WCP 4-82, April 12, 1982; WCP 3-84, March 9, 1984; WCP 4-85, April 1985; and personal communication with officials of the U.S. Department of Agriculture, Foreign Agricultural Service.

Figure 16. U.S. Soybean Yields in Bushels per Acre, 1950-85.



Source: U.S. Department of Agriculture, Statistical Reporting Service, Crop Reporting Service, Crop Reporting Board, *Crop Production, 1984 Summary,* crpr 2-1 (85), (Washington, D.C.), January 1985; *Field Crops,* Statistical Bulletin No. 708, and various other issues.

Cassava Root Production Increases

Despite a long-term upward trend in global utilization of grain, cassava production continues to be an important source of energy for human and animal consumption in some parts of the world. Cassava is a root crop sometimes known as tapioca or manioc with major producing areas located in tropical latitudes. Leading cassava producing nations are Brazil, Thailand, Indonesia, Zaire, and Nigeria. As shown in Table 10, Latin American production has declined slightly since the late 1970s, while production has accelerated sharply in the Far East. African cassava production has increased by slightly more than one-tenth since 1979, while Far East production expanded by about one-fourth during the 1979-84 period.

While much of the cassava in major producing nations is consumed domestically, Thailand is a major exporter of this product. Its exports until recently went largely to the European Community (EC) for use as livestock feed. However, EC imports of cassava serve as a grain substitute, thus contributing to the community's surplus of grain stocks. Accordingly, EC has negotiated voluntary import limitations with Thailand, and a portion of Thai exports are now being directed into USSR, Republic of Korea, Israel, Taiwan, and Portugal. The EC's current cassava trade agreement with Thailand expires at the end of 1986, and trade sources indicate EC import volumes may possibly be lowered in any new agreement.[5] If so, the result will likely be a further diversification of Thailand's exports into centrally planned and Asian markets. In Brazil, cassava production is intended to be used partly as a raw material for alcohol fuel production, although low world sugar prices in recent years have slowed this development by making sugar an attractive raw material for the Brazilian alcohol industry.

In Africa, extensive cassava production partially compensates for a low level of per capita grain production. However, as Table 10 indicates, African production has shown little upward trend so far this decade and per capita supplies thus have declined since 1981. That, along with drought-reduced grain production, has contributed to critically short food supplies in much of Sub-Saharan Africa.

Global Pulse Production Relatively Stable

Pulses are an important source of protein in diets of developing nations where fish, livestock, dairy, and poultry product consumption are low. Thus, pulse production trends provide some indication of changes in the quality of diets in such areas. Major pulses include green peas, chickpeas, lentils, cowpeas, mung beans, navy beans, and other edible beans. As Table 11 indicates, global pulse production in 1984 increased by an estimated 3 percent from the previous year's level, but barely exceeded the previous record production in 1976. From a longer-term perspective, estimated 1984 world production was only 6 percent above the 1973 level.

Since the total population of developing nations increased by more than one-fourth during this same 1973-84 time period, diverging trends of population and pulse production reveal declining per capita production of an important source of protein in Third World countries. To maintain nutritional levels, increased priority on pulse production in countries where it is a critical factor in diets and/or policies to encourage greater use of other protein sources will be important in the years ahead.

Table 10. Cassava Production in Major Producing Nations from 1973 through 1984 in Millions of Metric Tons.[a]

Area of Country	1973	1979	1981	1982	1983	Prelim. 1984
China	2.0	2.7	4.0	3.7	3.9	4.1
India	6.4	6.1	5.3	5.3	5.1	5.4
Indonesia	11.4	13.8	13.3	13.0	12.2	14.7
Philippines	N.A.	2.2	2.3	2.0	2.3	2.3
Thailand	5.7	11.1	16.8	17.8	17.8	20.0
Others	N.A.	4.6	4.5	3.7	3.9	4.2
Far East Total	N.A.	40.5	46.2	45.5	45.2	50.7
Ghana	1.6	1.8	1.6	2.0	1.5	1.9
Mozambique	2.4	2.7	2.9	2.9	1.9	2.2
Nigeria	9.6	10.5	11.8	11.7	10.0	12.0
Tanzania	3.8	4.6	6.8	5.0	5.4	5.6
Zaire	11.0	12.0	12.4	14.2	14.6	14.3
Others	11.7	13.4	14.2	14.8	10.0	14.4
Africa Total	40.1	45.0	49.7	50.6	43.4	50.4
Brazil	26.5	25.0	24.8	24.0	21.7	20.8
Columbia	2.0	1.9	2.1	2.0	2.1	2.0
Others	2.6	3.2	4.2	4.2	4.4	4.5
Latin America Total	31.1	30.1	31.1	30.2	28.2	27.3
World Total	100.5	116.7	127.2	126.6	122.0	128.6

[a] Sources: Food and Agriculture Organization of the United Nations, *Food Outlook*, No. 2, 1983 (Rome, Italy), February 27, 1984; and *Food Outlook, 1983 Statistical Supplement* (Rome, Italy), March 1984; *Food Outlook*, No. 3, 1985 (Rome, Italy).

World Livestock and Poultry Meat Production Trends

Since the mid-1950s, world meat production has been responsive to changes in consumer incomes in developed nations, and has been an important indicator of global demand for coarse grains, protein meal, and other livestock and poultry feed ingredients. After expanding moderately during the 1960s and 1970s, world production of red meat (beef, pork, lamb, and mutton) and poultry meat entered a period of much slower growth in the early 1980s. The recent slower growth appears to reflect sluggish world economic growth as well as health concerns in the U.S. and possibly other areas. Slower growth of livestock and poultry production, in turn, has contributed to the slower rate of expansion in world consumption of coarse grains (or feed grains) and protein meal, and the resulting downward pressure on U.S. dollar prices of these commodities.

Pork and Beef Production Expand Slowly

Table 12 shows pork production trends in major producing countries since the mid-1970s. Tentative forecasts indicate 1985 production will be 0.2 percent above the previous year and 7.4 percent above four years earlier. With world population growing at a compound rate of about 2 percent annually, world per capita pork production thus is estimated to have declined slightly during the first four years of the decade. Pork production in North America has fallen moderately below peak levels of the late 1970s, while continuing to expand in Western Europe, USSR, China, and other Asian nations. The most dramatic increase in pork output in recent years has occurred in China, where 1985 production is forecast to be 64 percent above the 1976-80 average. Sharply expanded Chinese pork production reflects that country's recent provision of

Table 11. World Pulse Production in Major Producing Areas, 1971-83, in Millions of Metric Tons.[a]

	1971	1973	1976	1978	1979	1980	1981	1982	Prelim. 1983	1984
Asia	21.4	20.7	23.0	22.3	22.2	19.7	21.2	21.2	[b]	[b]
Africa	4.5	4.7	5.6	5.3	5.4	5.3	5.3	5.7	[b]	[b]
Central America	1.6	1.6	1.3	1.7	1.5	1.8	2.3	1.8	2.2	[b]
S. America	3.4	2.9	2.6	3.0	3.1	2.7	3.3	3.9	2.4	[b]
N. America	1.1	1.0	1.1	1.3	1.3	1.7	1.9	1.6	1.1	[b]
W. Europe	2.2	2.0	1.6	1.8	1.8	1.9	1.8	2.0	[b]	[b]
E. Europe	1.0	0.8	0.6	0.8	0.7	0.7	.9	.8	[b]	[b]
USSR	6.9	8.4	8.7	7.8	4.3	6.4	5.6	6.5	6.6	[b]
Oceania	0.1	0.1	0.2	0.1	0.2	0.2	.2	.3	[b]	[b]
World Total	42.2	42.2	44.7	44.1	40.5	40.4	42.5	44.0	43.7	44.9

[a] Sources: Food and Agricultural Organization of the United Nations, *Food Outlook 1983 Statistical Supplement* (Rome, Italy), March 1984; *Food Outlook 1984* (Rome, Italy), July 1984 and The State of Food and Agriculture 1984 (Rome, Italy), November 1984.

[b] Data not available.

economic incentives to farm workers to increase grain and livestock productivity. At current production levels, China's pork production is estimated to be more than twice as large as that of either the U.S. or USSR and 46 percent larger than EC production. As shown in Table 12, Eastern Europe also is a major pork production area. Despite serious economic problems and foreign debt burdens in that area, Eastern European pork production has expanded approximately 7.8 percent from the recent low point in 1982.

In contrast to pork, North American beef production trended slightly upward from the late 1970s through 1984, but is expected to decline slightly in 1985 (see Table 13). European Community production followed a similar pattern, while beef output fell slightly in Oceania and South America. USSR beef production continued its long-term upward trend, with 1985 production forecast at 9 percent above the level of five years earlier.

Poultry Meat Production Continues Slight Upward Trend

In each of the last five years, total poultry meat production has continued to expand in major poultry producing nations. Aggregate production, as shown in Table 14, increased by an estimated 23 percent from 1979 to 1985. During this time period, major expansion occurred in the U.S. (up 22 percent), South America (up 40 percent), EC (up 13 percent), USSR (up 40 percent), and Japan (up 27 percent). With slow world economic growth, the world poultry meat industry has had a cost advantage over red meats due to more efficient feed conversion. In addition, new methods of processing poultry products both for retail supermarkets and fast-food outlets likely have increased consumer acceptance of poultry meat. For the years immediately ahead, these same developments appear likely to bring a continued upward trend in world poultry production at approximately the same rate as in the past five years.

Table 12. Pork Production in Major World Producing Areas, 1974-78 Average and 1980 through 1985 in Millions of Metric Tons.[a]

Area	1974-78 Average	1980	1981	1982	1983	Prelim. 1984	Proj. 1985
U.S.	5.9	7.5	7.2	6.5	6.9	6.7	6.5
Other N. America	1.5	1.8	1.7	1.8	2.0	1.8	1.7
S. America	1.0	1.2	1.2	1.2	1.2	1.1	1.1
EC-10	8.2	9.1	9.5	9.4	9.7	9.8	9.8
Other W. Europe	1.9	2.4	2.3	2.5	2.5	2.5	2.5
E. Europe	6.3	6.9	6.6	6.4	6.6	6.8	6.9
USSR	5.2	5.2	5.2	5.3	5.8	5.9	6.0
Asia (Exc. PRC)	2.0	2.7	2.6	2.7	2.8	3.0	3.0
Oceania	.2	.2	.2	.2	.2	.3	.2
China (PRC)	8.7[c]	N.A.	11.9	12.7	13.2	14.0	14.3
World Total[b]	40.9	37.0	48.4	48.7	50.9	51.9	52.0

[a]Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Livestock and Poultry Situation*, (Washington, D.C.), FL&P 2-83, May 1983; FL&P 1-84, April 1984; and FL&P 1-85, (Washington, D.C.), April 1985.

[b]Totals may not add due to rounding.

[c]Average production for 1976-80.

Table 13. Beef and Veal Production in Major World Producing Areas, 1974-78 Average and 1980 through 1985 in Millions of Metric Tons.[a]

Area	1974-78 Average	1980	1981	1982	1983	Prelim. 1984	Proj. 1985
				(Carcass Weight)			
U.S.	11.5	10.0	10.4	10.4	10.7	10.9	10.6
Other N. America	2.2	2.2	2.3	2.4	2.3	2.3	2.4
S. America	6.1	6.3	6.6	6.4	6.2	6.0	6.2
EC-10	6.6	7.0	6.9	6.6	6.8	7.4	7.2
Other W. Europe	1.1	1.3	1.2	1.2	1.2	1.1	1.2
E. Europe	2.5	2.5	2.3	2.5	2.5	2.5	2.5
USSR	6.7	6.6	6.6	6.6	7.0	7.1	7.2
S. Africa	0.5	0.6	0.5	0.6	0.6	0.6	.6
Asia (Excl. PRC)	0.8	1.0	1.0	1.1	1.1	1.1	1.1
Oceania	2.4	2.0	1.9	2.2	1.9	1.7	1.8
Total	40.4	39.5	39.7	40.0	40.3	40.7	40.8

[a]Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Livestock and Poultry Situation*, (Washington, D.C.), FL&P 2-83, May 1983; FL&P 1-84, April 1984; and FL&P 1-85, April 1985.

Table 14. Total Poultry Production in Major World Producing Areas, 1974-78 Average and 1980 through 1985 in Millions of Metric Tons.[a]

Area	1974-78 Average	1979	1981	1982	1983	Prelim. 1984	Proj. 1985
U.S.	5.3	6.5	6.9	7.0	7.1	7.4	7.9
Other N. America	.8	.9	1.1	1.1	1.1	1.1	1.2
S. America	1.0	1.5	2.0	2.1	2.1	2.0	2.1
EC-10	3.4	3.8	4.1	4.4	4.3	4.3	4.3
Other W. Europe	.9	1.0	1.2	1.2	1.1	1.1	1.1
E. Europe	1.6	1.9	2.0	1.8	1.8	1.8	1.8
Soviet Union	1.5	2.0	2.3	2.4	2.6	2.7	2.8
Africa	.2	.4	.5	.5	.6	.6	.7
Japan	.9	1.1	1.1	1.2	1.3	1.3	1.4
Other Asia and Oceania	.4	.5	.8	.8	.9	.8	.9
Total	16.0	19.6	22.0	22.5	22.9	23.1	24.2

[a]Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Livestock and Poultry Situation*, (Washington, D.C.), FL&P 2-83, May 1983; FL&P 1-84, April 1984; and FL&P 1-85, April 1985.

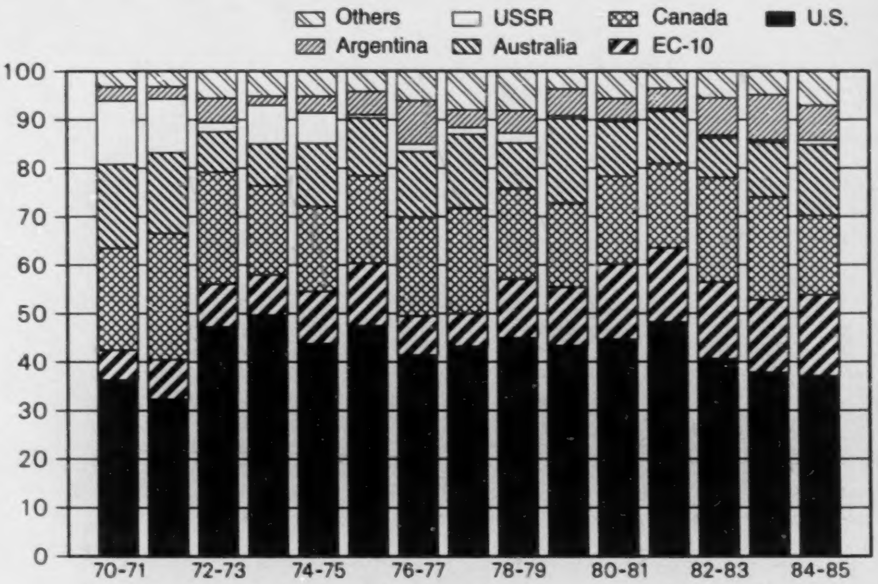
U.S. Shares of World Wheat and Coarse Grain Trade Down

Preliminary data indicate the U.S. share of global wheat exports declined again in 1984-85, for the third consecutive year. The recent downward trend brings the U.S. wheat trade share down to 37 percent of the world total, nearly the same as in 1970-71 and down from peak levels of nearly 50 percent in 1973-74, 1975-76, and 1981-82 (see Figure 17). A declining U.S. trade share in 1984-85 reflected continued large foreign wheat supplies and the strong U.S. dollar, which placed U.S. wheat at a competitive disadvantage relative to other exporters. Competition was especially strong from the European Community (EC) and Australia as a result of record crops and sizable carryover stocks in these areas. The EC's share of world wheat trade reached 17 percent in 1984-85, up from approximately 7 percent in 1970-71. The 1984-85 Australian share, however, was slightly less than 14 years earlier. Canada and Argentina experienced even greater declines in trade shares in 1984-85 than the U.S., partly because of weather-reduced harvests.

Longer-term Wheat Trade Patterns

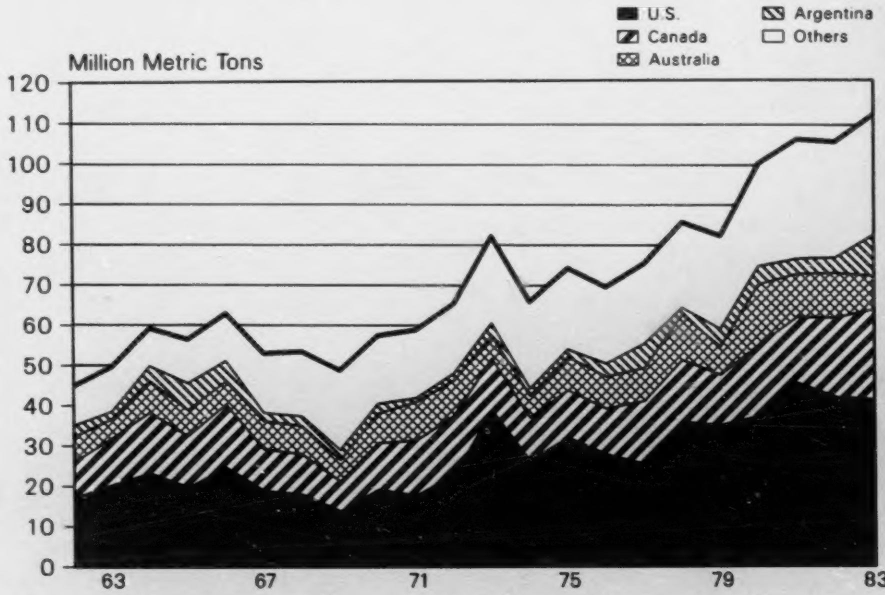
From a longer-term perspective, the U.S. share of global wheat trade was able to increase rapidly in the early 1970s as U.S. wheat growers and the U.S. grain trade responded quickly to rising world demand. Profits from growing world demand and changing government programs brought more than a 50 percent increase in planted U.S. wheat area in only four years' time. A private enterprise economic system, combined with increased grain merchandising margins, quickly generated additional investments in U.S. grain handling and transportation capacity, thus enabling increased production to be moved into export markets. Along with these developments, a depreciation of the U.S. dollar increased the purchasing power of foreign buyers as well as the competitiveness of U.S. wheat relative to that of foreign competitors. In the meantime, with a time lag, foreign wheat production began to rise due to increased use of fertilizer, higher yielding varieties, and increased plantings in some area. This was particularly true in EC and Argentina, when both experienced steadily increased wheat export shares in the late 1970s and early 1980s. Trade shares of the other two major wheat exporters, Canada and Australia, fluctuated significantly from year to year due to more variable climatic conditions and greater variability of production.

Figure 17. Percentage Shares of World Wheat Trade by Major Exporters, July-June, 1970-71 to 1984-85.



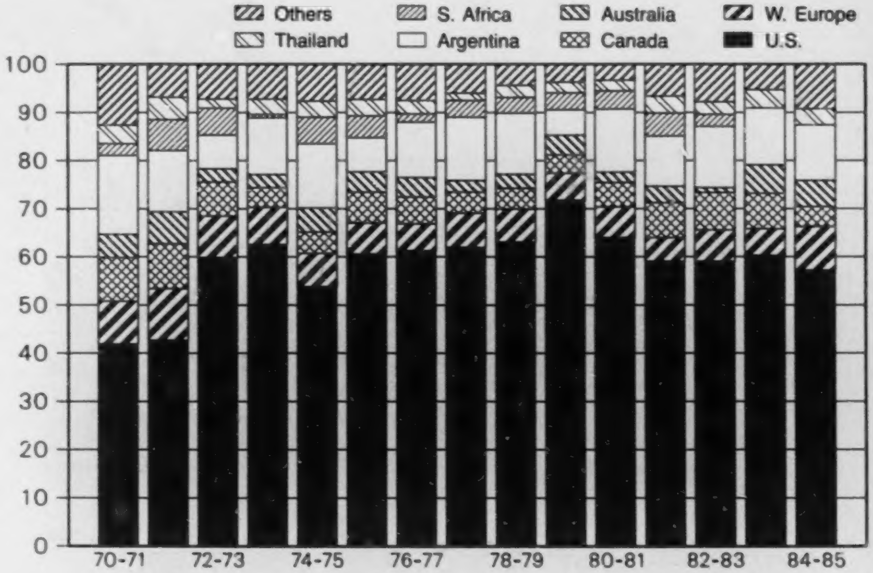
Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains*, FG 7-85 (Washington, D.C.), May 1985 and various other issues.

Figure 18. World Wheat Export by Country of Origin, Calendar Years 1962-83.



Source: Food and Agriculture Organization of the United Nations, *Trade Yearbook* (Rome, Italy), various issues.

Figure 19. Percentage Shares of World Coarse Grain Exports by Major Exporters 1970-71 to 1984-85.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains*, FG 7-85 (Washington, D.C.), May 1985 and various other issues. Marketing year data were accumulated on a July-June basis from 1970-71 through 1978-79. The USDA switched to an October-September fiscal year starting in 1979-80.

In the next few years, the U.S. may experience some further erosion of its wheat export share, depending on its future trade, grain reserve and price support policies, and the exchange rate of the U.S. dollar relative to foreign currencies. The EC farm policies continue to be directed toward self-sufficiency in agricultural production with internal price supports that encourage production, discourage consumption, and subsidize exports. Even with an increase in EC wheat feeding, that area will likely continue to offer strong competition in world wheat trade. In addition, Argentina has recently reduced its grain export taxes and has also placed a tax on idle farm land. Both developments should encourage increased grain production and exports. Also, Canada is taking steps to expand its grain handling and transportation capacity, with the stated goal of sharply increasing its grain exports. These developments appear likely to be met by significant changes in U.S. grain trade and price support programs, as will be noted in the policy section of this report.

Coarse Grain Export Shares

After temporarily surging upward in 1979-80, the U.S. share of global coarse grain trade dropped back to about the 60 percent level for the next four years. That was approximately the same trade share the U.S. had obtained during the 1972-73 to 1978-79 period. Then in 1984-85, according to preliminary data, the U.S. share of world coarse grain trade dropped to 57 percent from 60 percent the previous year. Except for 1974-75 when the U.S. corn (maize) crop was severely reduced by drought, 1984-85 represented the lowest U.S. share of global coarse grain exports since 1971-72. The declining U.S. trade share in 1984-85 reflects increasing export shares originating in Western Europe, as well as reemergence of the People's Republic of China as a corn and sorghum exporter (included in the "Others" category in Figure 19).

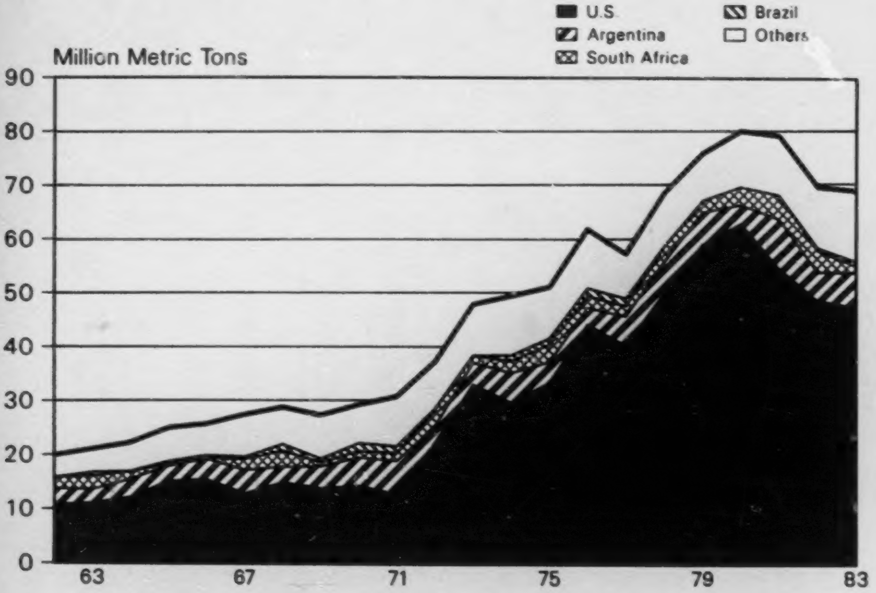
For the second consecutive year, South Africa's corn crop was struck by severe drought in 1984 and prevented that nation from regaining its normal position as the world's third-ranking corn exporter. As shown in Figure 19, export shares of most other major coarse grain exporters including Canada, Australia, Thailand, and Argentina have varied considerably from year to year. These nations normally do not carry reserve grain stocks; thus weather fluctuations are a major factor behind year-to-year variations in their respective shares of world coarse grain trade. A 1984 drought sharply reduced Canada's share of world coarse grain exports in 1984-85 although some recovery is anticipated in 1985-86.

Figure 20 shows the dramatic rise in U.S. corn exports in the 1970s, while non-U.S. exports during the same period remained relatively stable. From 1980 to 1983, however, U.S. corn exports fell by 24 percent, while corn exports from all other nations as a group rose by 28 percent. As a result, U.S. corn exports declined more sharply than the world total and brought severe financial pressures to U.S. grain producers, grain and farm supply firms, the U.S. grain transportation industry, and port elevators.

Prospects for the U.S. share of coarse grain exports in the next few years are uncertain and will depend on: (1) U.S. price support, grain reserve, and acreage control policies; (2) exchange rates of the U.S. dollar against foreign currencies; (3) Soviet grain production levels; (4) world economic growth rates; and (5) weather in major U.S. and foreign coarse grain exporting areas. At this writing, demand indicators point to steady to slightly increased global coarse grain exports through the late 1980s and early 1990s. If this proves correct, U.S. corn and coarse grain exports likely will continue to face strong foreign competition in the next few years.

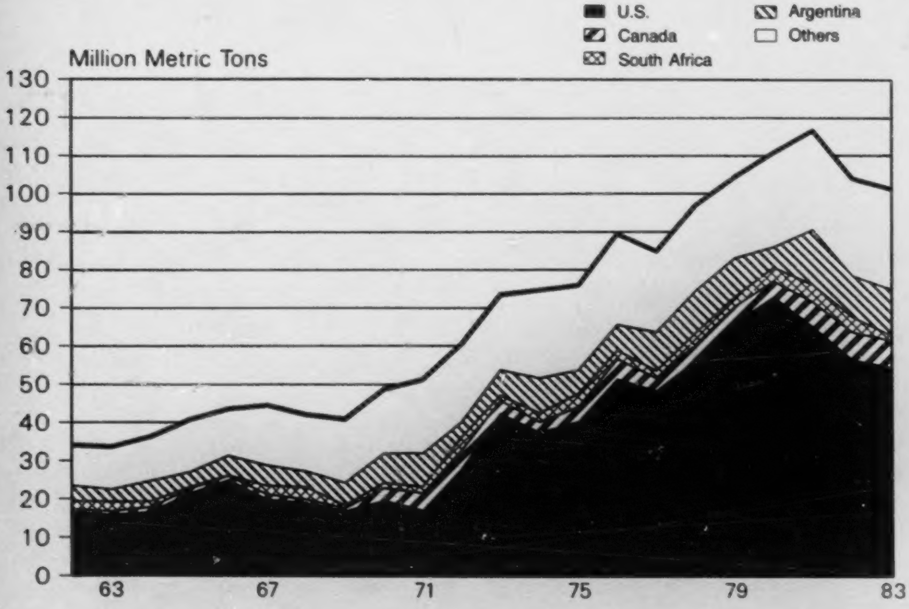
In the event of a sharp upturn in world trade, however, U.S. corn and coarse grain exports likely could be increased more rapidly than those of foreign competitors—with a resulting increase in the U.S. trade share. Unlike most other coarse grain exporting nations, the U.S. has substantial excess handling and exporting capacity, land that is currently being idled from production, and reserve grain stocks that could quickly be used to meet expanding world demand.

Figure 20. World Corn Exports by Country of Origin, Calendar Years 1962 to 1983.



Source: Food and Agriculture Organization of the United Nations, *Trade Yearbook* (Rome, Italy), various issues.

Figure 21. World Coarse Grain Exports by Country of Origin, Calendar Years 1962 to 1983.



Source: Food and Agriculture Organization of the United Nations, *Trade Yearbook* (Rome, Italy), various issues.

Figures 19-21 illustrate that despite the recent lower level of world exports and a declining trade share, U.S. corn and coarse grain exports are vitally important to foreign livestock industries. U.S. corn exports still account for two tons out of every three traded in world markets and over half of all coarse grains moving into international trade. These grains are used primarily for livestock and poultry feed in industrial and rapidly developing nations.

Other major coarse grain exporters include Argentina, France, Canada, and Thailand. South Africa is likely to regain its former position as the world's third-ranking corn exporter in the next few years, with a return to more normal weather in its grain belt. Despite policies intended to encourage a return to its former corn export position of the 1960s and early 1970s, Brazil remains a net corn importer. Even though long-term sales commitments have been made with the USSR, recent performance suggests Brazil is likely to have difficulty in re-emerging as a significant corn exporter on a consistent basis in the next few years. Restraints on Brazilian production potential include more attractive alternatives in competing crops, high costs of fertilizer and other purchased inputs, and difficulties of accumulating capital and financing production in a hyper-inflation economy.

Soybean and Soybean Product Trade Shares

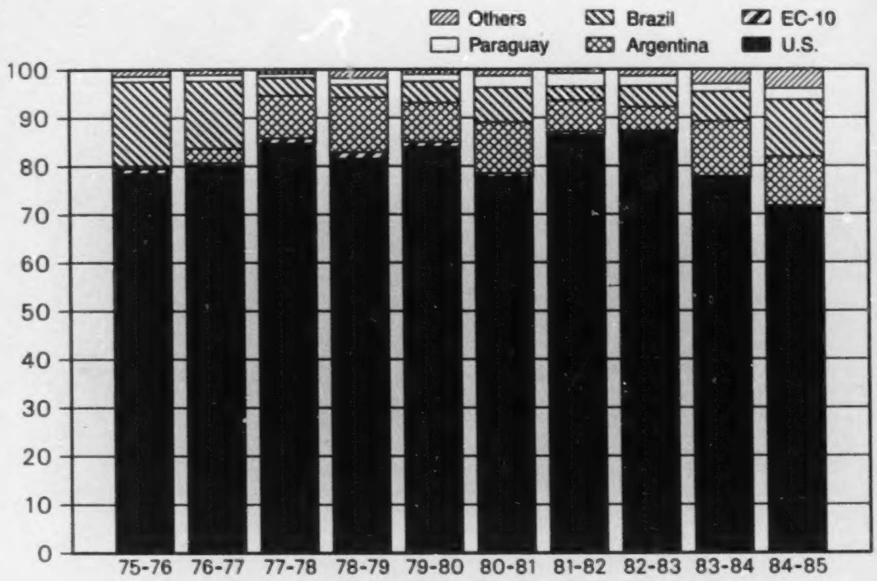
Soybeans

The U.S. share of global soybean trade declined moderately again in 1984-85 (see Figure 22), dropping to the lowest level in recent years. Preliminary data place the U.S. share at 71 percent, down from an average of over slightly 80 percent in the 1975-76 through 1983-84 period. The declining U.S. share was offset by increased exports from Brazil, Argentina, and Paraguay. Along with favorable weather and record March-May 1984 and 1985 soybean harvests in these nations, the U.S. trade share has been reduced by a sharp drop in world soybean exports and the strong U.S. dollar.

Much of the decline in U.S. and world exports reflects reduced demand for soybeans and soybean meal in Western Europe. Factors contributing to that area's reduced demand included: (1) an aggressive EC program to reduce surplus dairy production; (2) increased wheat feeding, with a resulting decline in protein meal needs since wheat has a higher protein content than corn; (3) a stabilizing of EC livestock and poultry production; and (4) large imports of U.S. corn gluten feed and meal as an alternative protein source. The dairy-reduction program reduced protein feed demand in that sector of EC agriculture.[6] In addition, the strong U.S. dollar placed U.S. soybeans and meal at a competitive disadvantage relative to foreign supplies, and debt problems have restrained demand growth in developing nations.

Prospects for the U.S. soybean trade share in the next few years remain clouded and will be influenced strongly by the timing of any major recovery in foreign demand for beans and meal. With a continued static demand situation, the U.S. trade share can be expected to remain under pressure from South American competition. But with an uptrend in demand, U.S. producers would likely be able to expand production more quickly and more aggressively than their foreign counterparts, thus regaining an increased share of world trade. World soybean trade has experienced brief periods of decline in some previous years, but has shown a remarkable capacity to rebound when global economic growth resumes an upward trend. Rising consumer incomes are closely linked with increased demand for livestock and poultry products, and consequently have a strong tendency to generate increased demand for protein meal. An additional influence on future export trends is Soviet agricultural policies and priorities given to protein meal imports by that nation (see USSR section of this report). With the average protein content of Soviet livestock and poultry rations well below western standards, a strong case could be made for increased imports by that nation in the next several years.

Figure 22. Percentage shares of World Soybean Trade by Major Exporters, October-September, 1975-76 to 1984-85.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Oilseeds and Products* (Washington, D.C.), FOP 5-83, May 1983; FOP 11-82, September 1982; FOP 16-81, September 1981; FOP 1-81, January 1981; FOP 10-80, May 1980; and FOP 5-85, May 1985.

Soybean Meal

The U.S. share of world soybean meal trade has declined much more sharply in recent years than that of unprocessed soybeans, and the rate of decline accelerated in 1984-85. While nearly three-fourths of the soybeans traded in world markets still are produced in the U.S., only about one-fifth of the soybean meal traded in world markets originates from U.S. processing plants. With strong foreign competition and depressed global demand for protein meal, U.S. soybean meal exports in 1984-85 for the first time dropped below those of the EC and Brazil (see Figure 23). In addition, Argentina has expanded its soybean processing capacity in recent years and additional capacity expansions are occurring in 1985. Thus, Argentina's share of world soybean meal trade also has increased sharply in the past three years and will likely increase further in the years immediately ahead. A high percentage of the soybeans processed in the EC are of U.S. origin, since climatic limitations have held that area's domestic production at extremely low levels. Spain and Portugal account for much of the soybean meal exports in the "Other" category of Figure 23.

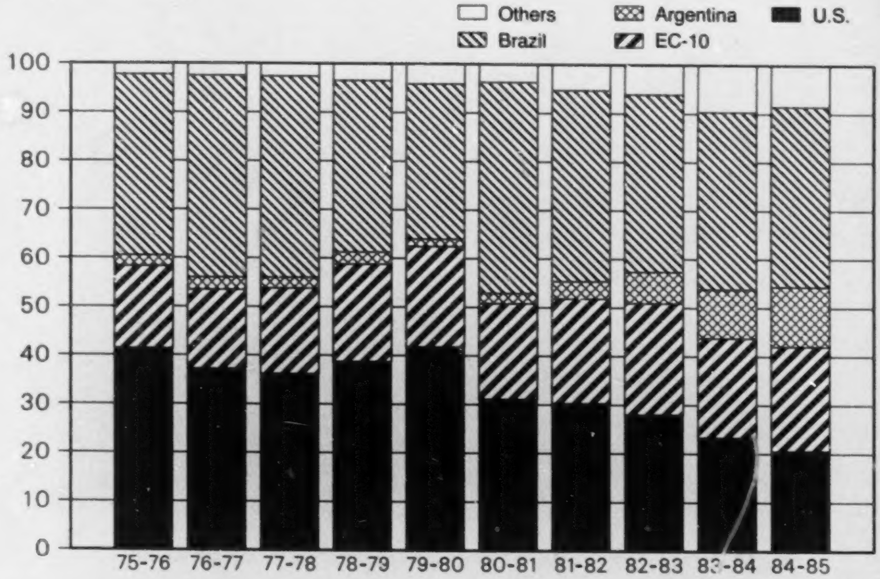
From a longer-term perspective, Brazil's share of world soybean meal exports has fluctuated from year to year with variations in the size of its crop. Its 1984-85 trade share was slightly below peak levels of the 1976-77 to 1977-78 period. The decline in the U.S. trade share since that time has come primarily from EC, Argentina, Spain, and Portugal. Increased trade shares by these areas reflect their governments' policies, which are designed to encourage exports of value-added products such as soybean meal and soybean oil. Value-added exports enable processing nations to benefit from increased domestic employment and retain any profits resulting from processing operations. Policies used to encourage such trade patterns will be discussed in a later section of this report.

Current trade policies of other meal exporting nations are strongly entrenched. With excess foreign processing capacity, the U.S. soybean processing industry likely will find intense competition in its efforts to maintain or expand its share of global soybean meal trade. In contrast to U.S. soybean export shares, the excess foreign processing capacity would make it difficult for the U.S. meal trade share to rebound sharply even in case of a strong recovery in world soybean meal demand.

Soybean Oil

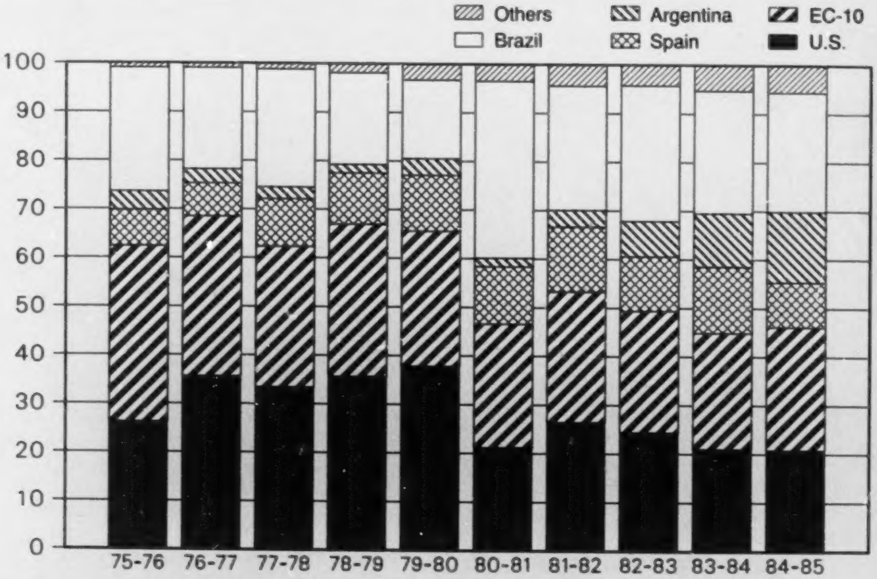
The U.S. share of global soybean oil exports has followed a pattern similar to that for soybean meal, except that the soybean oil share held approximately constant in 1984-85. U.S. soybean meal's share of world trade, as noted in the preceding section, declined moderately in 1984-85. As with meal, the U.S. now ranks third in soybean oil exports, behind Brazil and EC (see Figure 24). Argentina's share has been increasing rapidly in the last few years and may well continue to trend irregularly upward in the remainder of the 1980s as that nation's soybean production and processing capacity expand. Competition from EC and Brazilian processing industries will depend heavily on trade policies of those areas as well as trends in Brazilian soybean production and domestic soybean oil consumption. Without major changes in trade policies, U.S. soybean oil exports appear likely to face continued strong competition from the nations shown in Figure 24 in the years ahead.

Figure 23. Percentage Shares of World Soybean Meal Trade by Major Exporters, October-September, 1975-76 to 1984-85.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Oilseeds and Products* (Washington, D.C.), FOP 5-83, May 1983; FOP 11-82, September 1982; FOP 16-81, September 1981; FOP 1-81, January 1981; FOP 10-80, May 1980; and FOP 5-85, May 1985.

Figure 24. Percentage Shares of World Soybean Oil Trade by Major Exporters, October-September, 1975-76 to 1984-85



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Oilseeds and Products* (Washington, D.C.), FOP 5-83, May 1983; FOP 11-82, September 1982; FOP 16-81, September 1981; FOP 1-81, January 1981; FOP 10-80, May 1980; and FOP 5-85, May 1985.

Trade Shares in Livestock Product Exports

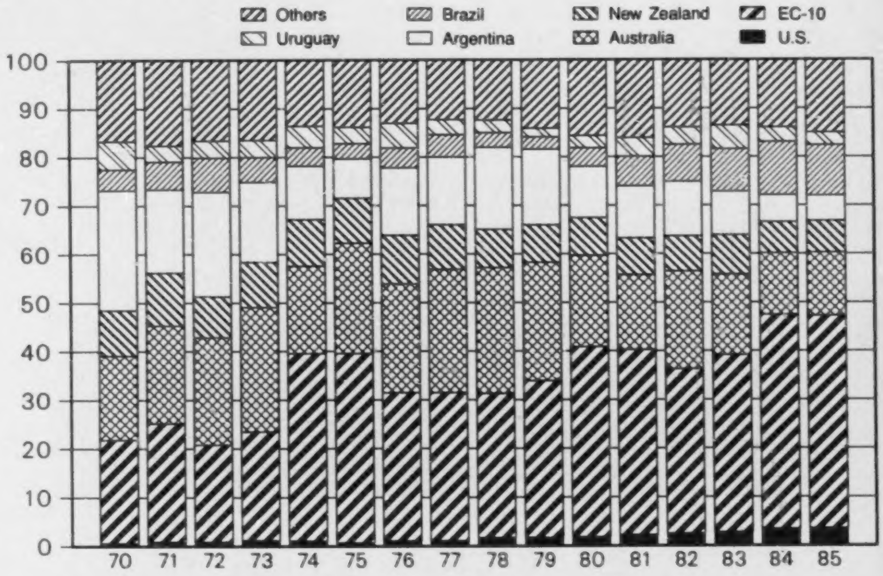
Beef and Veal Exports

The U.S. share of world beef and veal exports has increased slightly over the past 15 years, including 1983 and 1984, along with an expected increase in 1985. However, U.S. beef and veal exports still represent less than 4 percent of world trade and are dwarfed by much larger exports from Australia and EC. One reason for the limited U.S. beef exports is that most of the world's beef trade is in lower quality products rather than the highly finished beef typically produced in the United States. The U.S. beef export share rose to 3.4 percent of world trade in 1984 and is expected to reach 3.5 percent in 1985. That compares with a U.S. trade share of only 0.6 percent in 1970.

Major non-U.S. exporters of beef in order of importance include the EC, Australia, Brazil, New Zealand, Argentina, and Uruguay. The substantial long-term growth in EC's share of world beef exports since 1970 has come largely at the expense of Australia, Argentina, and New Zealand. Sizable yearly fluctuations in exports from Australia and Argentina reflect an unstable climate in those areas, with herd liquidation tending to increase supplies and depress prices during drought years. Conversely, when pasture and range conditions are favorable, producers tend to retain animals to rebuild herds—with a resulting decline in beef supplies.

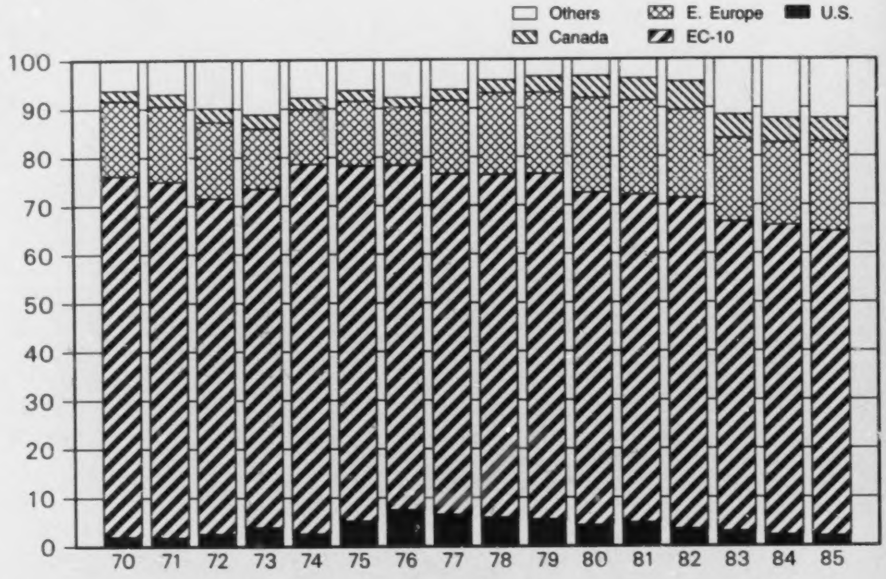
Australia was in a herd expansion phase from late 1983 through at least mid-1985, after experiencing severe drought and herd liquidations in the early 1980s. Argentina's declining export share at least partially reflects that country's increased emphasis on wheat, corn, sorghum, sunflowerseed, and soybean exports as sources of foreign exchange earnings.

Figure 25. Percentage Shares of World Beef and Veal Trade by Major Exporters, 1970-85 Calendar Years.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Livestock and Poultry Situation* (Washington, D.C.), FL&P 2-83, May 1983; FL&P 1-84, April 1984; and FL&P 1-85, April 1985. *Foreign Agriculture Circular, Livestock and Meat* (Washington, D.C.), FLM 2-81, February 1981; FLM 2-80, February 1980; FLM 9-78 and 10-78, September 1978.

Figure 26. Percentage Shares of World Pork Trade by Major Exporters, 1970-85 Calendar Years.



Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Livestock and Poultry Situation* (Washington, D.C.), FL&P 1-82, April 1982; FL&P 1-84, April 1984; and FL&P 1-85, April 1985; *Foreign Agriculture Circular, Livestock and Meat* (Washington, D.C.), FLM 2-81, February 1981; FLM 2-80, February 1980; FLM 9-78 and 10-78, September 1978.

Pork Export Shares

The EC also is the world's largest pork exporting area, with its exports since 1970 accounting for 63 to 77 percent of world pork trade. However, its share of global exports has trended slightly downward since the mid-1970s. During this same period, Canadian and East European export shares have increased slightly. The U.S. pork export shares reached a peak in 1976 and have been declining gradually since, partly because of strong European and Canadian competition. The U.S. share of world pork exports is expected to be approximately 2 percent in 1985, only about one-third as large as its record 1976 trade share. While some growth in U.S. pork exports is possible in future years, provided the U.S. dollar moves to a more realistic level in foreign currency markets, U.S. producers continue to face sizable import barriers in other countries and strong competition from other pork exporting nations.

Poultry Meat Export Shares

As shown in Table 15, the U.S. share of world poultry meat exports has been on a downward trend since 1981. The U.S. poultry meat exports in 1985 are expected to account for approximately 12 percent of the world total, down from 20 percent in 1980. World poultry meat exports grew rapidly in the late 1970s and early 1980s but have trended slightly downward since 1981 as importing nations struggled with slower rates of economic growth and debt burdens. The declining U.S. trade share probably has been influenced also by the strong U.S. dollar and a resulting increase in cost to foreign buyers for purchases of U.S. poultry. In addition, debt pressures and high interest costs have encouraged Brazil and Eastern Europe to place greater emphasis on value-added exports as a means of earning foreign exchange. In the U.S., a shift in dietary patterns from red meat to poultry meat may also have contributed somewhat to the decline in its export share. In the next few years, these same forces likely will continue to influence patterns of world trade in poultry meat.

Table 15. World Poultry Meat Exports by Major Exporters, 1974-78 Average and 1979 through 1985 in Thousands of Metric Tons.[a]

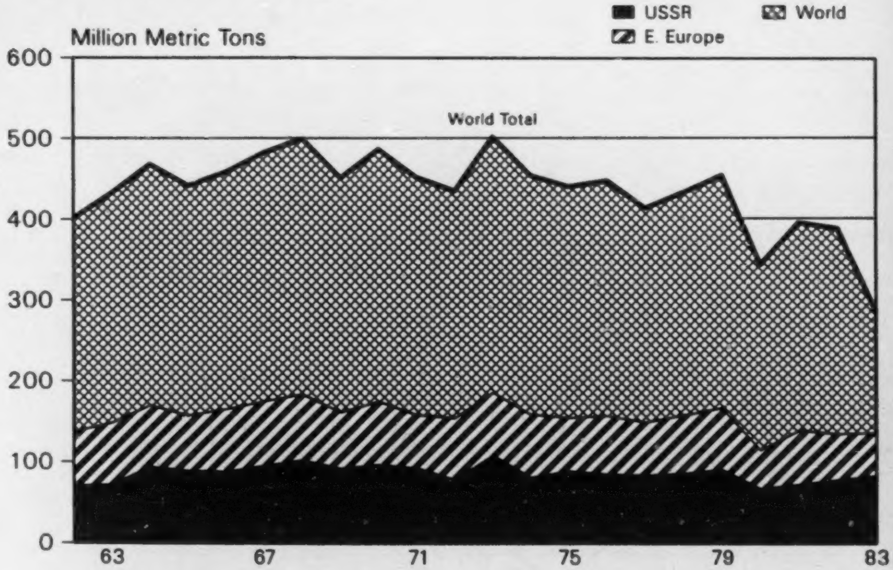
Area	1974-78 Average	1979	1981	1982	1983	Prelim. 1984	Proj. 1985
U.S.	148	228	375	261	225	209	190
Brazil	23	81	295	302	289	251	241
EC-10	473	605	830	826	836	740	747
E. Europe	173	196	289	310	297	294	301
World Total	853	1,156	1,837	1,736	1,684	1,522	1,521

[a] Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Livestock and Poultry Situation,* (Washington, D.C.), FL&P 1-84, April 1984; FL&P 2-83, May 1983; and FL&P 1-85, April 1985

Potato Production Trends in Eastern Europe

Potatoes are an important livestock feed in Eastern Europe and USSR, in addition to their use for direct human consumption in many other areas. Figure 27 shows the trend in production in these areas as well as global production since 1962. Production in both USSR and Eastern Europe has shown a modest downward trend since the late 1960s, with the Soviet Union 1983 potato harvest being about one-fifth less than in 1968. Eastern Europe's 1983 potato crop is estimated at nearly two-fifths less than 15 years earlier. With potato production in other areas also declining, reduced Soviet and East European production brought a sharp decline in global output. The long-term downward trend in potato production in these centrally planned countries probably has contributed to increased coarse grain feeding and a long-term upward trend in grain imports by Soviet Bloc nations, along with growth of livestock and poultry production.

Figure 27. World Potato Production in Millions of Metric Tons by Major Producing Areas, 1962-83 Calendar Years.



Source: Food and Agriculture Organization of the United Nations, *Production Yearbook* (Rome, Italy), various issues.

Trends in World Fish Production[8]

In addition to cereal grains, oilseeds, livestock and poultry products, and root crops, fish are an important staple in diets in many areas. Data from the United Nations Food and Agricultural Organization (FAO) indicate the global fish catch is continuing its long-term upward trend, but at a much slower rate than in the pre-1970 period. As data in Table 16 indicate, global catch of fish and other seafood rose at an average rate of 2 percent annually from 1973 to 1982. That is a substantial decline from the 6 percent annual growth rate from the late 1950s until 1970. The current annual catch of fish, crustaceans, and molluscs is estimated at 76.5 million metric tons, with 52 percent of the catch originating from fishing industries of developed nations. About two-thirds of the catch is used for direct human consumption with the remainder reflecting spoilage and utilization for animal feed.

Table 16. Global Catch of Fish, Crustaceans, and Molluscs, Selected Years and Regions, 1973 to 1983, in Millions of Metric Tons.[a]

	1973	1982	1983	Annual Percent Change 1973-82
Developed Nations				
North America	3.9	5.4	5.4	+4.3
Oceania	0.2	0.3	0.3	+4.4
W. Europe	11.3	10.9	10.9	−0.3
Total, all developed nations	36.0	39.2	40.1	+0.7
Developing Nations				
Africa	4.0	3.3	3.5	−2.5
Far East	10.7	14.1	14.7	+3.2
Latin America	5.2	11.4	9.2	+7.6
Near East	0.6	1.1	1.1	+6.1
Asian Centrally Planned	5.8	7.2	7.6	+1.7
World Total	62.7	76.4	76.5	+2.0

[a] Source: Based on Council, Food and Agricultural Organization of the United Nations, Eighty-Sixth Session, *The State of Food and Agriculture, 1984*, (Rome, Italy), November 19-30, 1984, pp. 22-24.

The declining rate of growth in the seafood catch in recent years reflects many fish species that are believed to have become fully exploited or overexploited. In addition, shifts in ocean currents and weather patterns can dramatically affect the fish catch in certain areas in some years. For example, the sharp drop in the 1983 fish catch in Latin America is believed to reflect the return of a warm ocean current to the Pacific Coast of parts of South America. A similar current was responsible for a sharp drop in the Peruvian catch a decade earlier. Slightly more than offsetting the decline in Latin American 1983 fish catch were substantial increases in Morocco, Senegal, Namibia, India, China, Thailand, Poland, and the Republic of Korea.

Developments in Soviet Agriculture and U.S. Trade Relationships

With large year-to-year fluctuations in its grain production and imports (see Figure 28), the Soviet Union is a major influence on the volume of grain traded in world markets and has considerable impact on world grain prices. For example, approximately one-fourth of the world grain trade and one-third of all U.S. corn exports in 1984-85 were accounted for by Soviet imports. Its significance as a price influencing factor is caused not only by the size and variability of its imports, but also by its relationship to the Soviet Union's centralized grain purchasing system. Import decisions in USSR are made by a small group of government officials who can contract for the nation's entire yearly grain import needs in a very short time, if they wish to do so. This centralized purchasing system creates the potential for an ever-present element of surprise in Soviet buying patterns.

The USSR's initial entry into world grain markets in the early 1970s as a large and continuous grain importer was a classic example of this surprise element, with Soviet buyers dealing with several large grain firms and failing to disclose the total size of their import needs to any one firm or to U.S. Department of Agriculture officials in charge of the wheat export subsidy program. Since that time, grain merchandisers throughout the world have continuously watched Soviet weather, political developments, and other factors that might reveal likely purchasing patterns. The importance of this potential surprise element stands out when the USSR purchasing system is contrasted with that of Japan, another large grain importer. Japan's private enterprise system spreads purchasing decisions over a large number of individual decision makers, and the element of potential surprise is much less significant than with the Soviet Union. In addition, Japan's grain import levels are relatively stable from year to year. Consequently, only very minor world grain price reactions usually follow Japanese purchase announcements.

1984-85 Soviet Grain Imports Set New Record

In 1984, a sizable part of the Soviet grain belt was struck by drought, with grain production dropping to the lowest level in three years and falling 10 percent below the average of the previous nine years. Last year's production also was the sixth consecutive year in which Soviet grain production fell sharply below the officially planned level. With a series of poor crops, record or near-record livestock and poultry production, and low grain carryover stocks, Soviet grain imports in 1984-85 jumped to a record 52 million metric tons (July-June trade year)—up 20 million metric tons or 63 percent from a year earlier. Previous record grain imports by the Soviet Union were 45 million metric tons in 1981-82, following an extremely low 160 million metric ton grain harvest. The following year, with moderately increased crop production, Soviet imports declined by 30 percent.

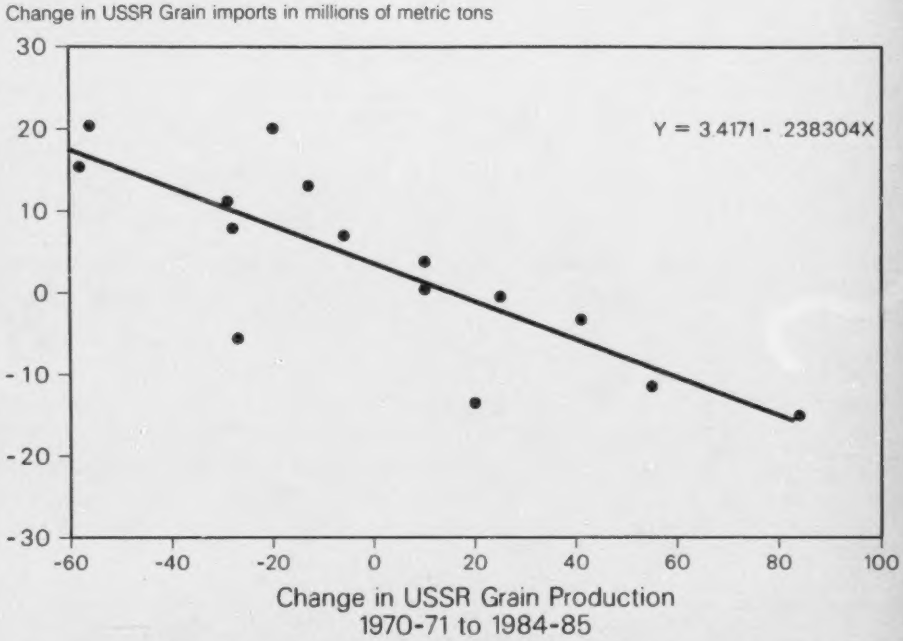
Soviet crop problems in 1984 were spread over both wheat and coarse grain production and, consequently, resulted in increased imports of both types of grain. Preliminary data indicate USSR 1984-85 wheat imports reached a record 26 million metric tons, approximately one-fourth larger than the previous year's record. Its coarse grain imports are estimated to have been more than twice as large as a year earlier, and 2 percent above the record 1981-82 import volume.

Longer-term Grain Production Prospects

Figure 29 shows little upward trend in Soviet grain yields since the early 1970s, and large year-to-year variability of yields. Future trends in Soviet grain imports will depend heavily on the success of that nation in reducing this annual yield variability and in overcoming apparent inability to improve the productivity of its grain sector. Factors contributing to these two problems are complex and include climatic limitations from a grain belt that lies largely on a latitude similar to that of the Canadian prairie provinces. The resulting climate includes a short growing season and substantial risk of drought as well as periodic problems from excessive rain or snow during the harvesting and winter wheat planting seasons.

Along with climatic limitations, Soviet agriculture appears to face serious coordination problems from its state-controlled agricultural system. Such problems are evident from reports of a chronic lack of spare parts and disabled machinery during key field-

Figure 28. Relationship Between Changes in Soviet Grain Production and Imports, 1970-71 through 1984-85.



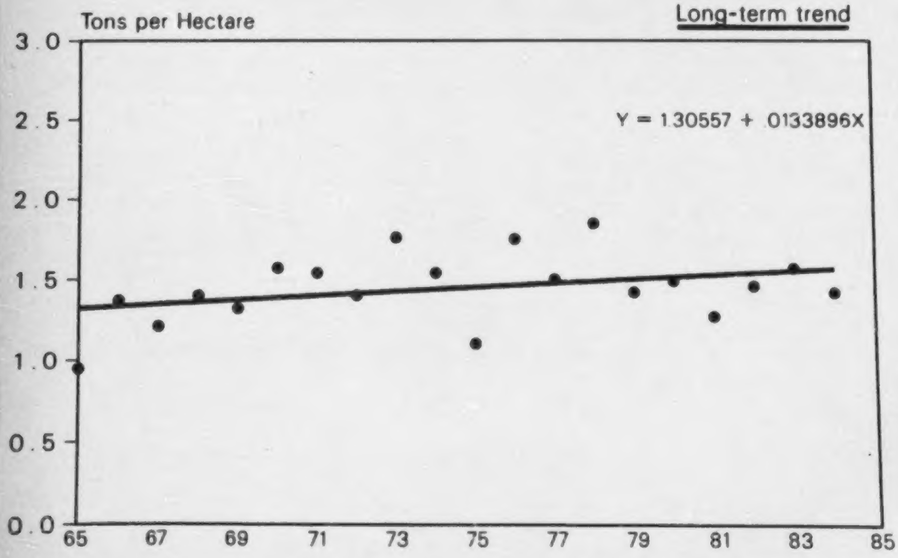
Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains* (Washington, D.C.), FG 25-76, October 7, 1976; FG 4-83, February 15, 1983; FG 7-85, May 1985.

work periods, inadequate crop drying and transportation equipment at harvest, reports of harvesting and planting delays as farm workers wait for instructions on the individual day's activities, lack of the proper type and quantities of fertilizer at the time it is needed, and similar problems with other inputs. With a short growing season, optimum timing and coordination of all operations is essential for an efficient crop production sector.

While substantial time likely will be required to achieve improved coordination in the Soviet crop sector, 1984-85 could well set the stage for a shift in that direction. During the past year, the top Soviet leadership position has been transferred to a relatively young person trained in agronomy and experienced in USSR agriculture. Massive Soviet grain and oilseed imports have absorbed foreign exchange that otherwide could have been used to improve industrial output, so a strong incentive exists for USSR to deal with lagging productivity in crop production. According to a recent U.S. Department of Agriculture publication, the current Soviet leader has emphasized streamlining and optimizing the current agricultural system, rather than making radical changes in the system itself.[9] In the streamlining process, a move reportedly is underway to improve labor productivity through a collective contract system where worker renumeration is linked more closely with output.[10]

Other Soviet policies aimed at improving crop production include large investments called for in a long-term program to drain approximately 20 million hectares of potential cropland by the year 2000 and to extend irrigation to 30 to 32 million hectares.[11] Available investment funds and costs of the projects will determine whether these goals are attained. Other investment plans call for expanded grain storage and handling facilities to reduce spoilage losses, and expanded production of fertilizer and farm machinery.[12] While Soviet grain and oilseed production likely will trend upward in the years ahead, the performance record of the last 15 years suggests that changes are likely to be gradual, and that USSR will likely continue its large and variable pattern of grain imports for the next several years.

Figure 29. Trend in Soviet Grain Yields in Metric Tons per Hectare, 1965 through 1984.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains* (Washington, D.C.), FG 25-76, October 7, 1976; FG 4-83, February 15, 1983; FG 7-85, May 1985.

Table 17. Soviet Grain, Soybean, and Soybean Meal Importing Patterns in Millions of Metric Tons, 1975-76 through 1984-85.[a]

	1975-76	1976-77	1977-78	1978-79	1980-81	1981-82	1982-83	Est. 1983-84	Proj. 1984-85
Wheat Imports[b]	10.1	4.6	6.6	5.1	16.0	19.5	20.2	20.5	26.0
Coarse Grain Imports[b]	15.6	5.7	11.7	10.0	18.0	25.5	11.3	11.5	26.0
Total Imports, Wheat and Coarse Grains	25.7	10.3	18.3	15.1	34.0	45.0	31.5	32.0	52.0
Percentage from U.S. Origin[c]	54%	72%	78%	74%	24%	34%	20%	44%	44%
Soybean Imports[a]	1.7	1.5	0.9	1.8	1.4	1.5	1.0	1.0	0.9
Percentage from U.S. Origin	18%	62%	93%	67%	0%	40%	40%	50%	0
Soybean Meal Imports[a]	0.0	0.1	0.0	0.5	1.0	1.1	2.8	0.5	0.6
Percentage from U.S. Origin	0%	100%	0%	10%	0%	0%	0%	0%	0%

[a] Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains* (Washington, D.C.), FG 23-82, July 16, 1982; FG 10-83, April 12, 1983; FG 7-85, May 1985. SG 8-84, June 12, 1984; SG-5-85, May 1985; *Foreign Agriculture Circular, Oilseeds and Products*, (Washington, D.C.), FOP 4-81, March 1981; FOP 9-82, July 1982; FOP 4-83, April 1983; FOP 6-84, June 1984; FOP 6-85, June 1985; U.S. Department of Agriculture, Agricultural Marketing Service, *Grain Market News* (Independence, Missouri), various issues; U.S. Department of Agriculture, Agricultural Marketing Service, *Feed Market News* (Independence, Missouri); and U.S. Department of Agriculture, Foreign Agricultural Service, *U.S. Export Sales* (Washington, D.C.), June 4, 1982, and various issues.

[b] July-June trade years.

[c] Imports from U.S. origin are on October-September marketing years.

Oilseed Prospects

Prospects for Soviet oilseed and/or oilseed products are less clear than those for grain. Official plans call for sharp increases in oilseed production but so far little progress has been made in that direction (see Table 18). Soviet livestock rations contain extremely low protein contents by western standards. Increased protein meal imports could enable Soviet agriculture to more efficiently use limited grain supplies and also could improve productivity of its livestock and poultry sector. Accordingly, some western analysts of Soviet agriculture believe the current leadership may place increased priority on oilseed and/or protein meal imports in the years immediately ahead.

Livestock Sector

In the USSR livestock sector, aggegate Soviet livestock numbers expanded slowly in 1984, with preliminary estimates of total meat production reaching a record 16.7 million metric tons, 1.5 percent above a year earlier. Milk and egg production also expanded at similar rates. Use of grain in livestock and poultry feed in the USSR has fluctuated in a relatively narrow range in recent years, despite increased meat, egg, and milk production.[13] Thus, feed conversion efficiency of the Soviet livestock sector appears to be trending upward. Further increases in feed conversion efficiency appear likely in the years ahead through animal breeding and genetics, improved animal health and nutrition, better management, and related developments.

U.S.-USSR Grain Agreement

The current U.S.-USSR Grain Trade Agreement went into effect in October 1983 and will have a duration of 5 years. It requires the United States to make available and the USSR to purchase a combined minimum of 9 million tons annually of U.S. corn and wheat—up from 6 million tons in the prior agreement. The current agreement also allows 0.5 million metric tons of soybeans or soybean meal to be substituted for 1 million tons of grain—at the discretion of USSR—in meeting the minimum purchase commitment. In addition, the agreement permits USSR to purchase a combined maximum of up to 12 million tons of U.S. wheat and corn without prior consultation with the U.S. government. With consultation, additional purchases beyond the 12 million ton limit may be permitted. In the 1984-85 trade year, the U.S. administration offered to make as much as 27 million tons of U.S. corn and wheat available to USSR if it desired to purchase that quantity.

The long-term agreement is a continuation of a U.S. trade policy with USSR initiated in the mid-1970s partly in an effort to bring greater stability in Soviet purchasing patterns and to reduce the element of potential surprise in such purchases. In nine years of such agreements, both sides have continued to honor their minimum commitments. Thus, it is highly likely that USSR will continue as a large importer of U.S. corn and wheat at least through the October 1987-September 1988 marketing year. Total purchases will likely continue to vary from year to year, depending on the size of the Soviet grain harvest, the availability of foreign exchange in USSR, and political relationships between the two nations.

Table 18. Soviet Oilseed Production in Millions of Metric Tons, 1972-73 through 1984-85.[a]

	Soybeans	Cottonseed	Sunflower
Projected			
1984-85	.44	4.68	4.50
Preliminary			
1983-84	.56	4.6	5.04
1982-83	.49	5.09	5.34
1981-82	.45	5.28	4.65
1980-81	.53	5.08	4.62
1979-80	.4	4.14	5.41
1978-79	.63	4.67	5.33
1977-78	.54	4.69	5.90
1976-77	.48	4.51	5.28
1975-76	.78	4.81	4.99
1974-75	.36	4.53	6.78
1973-74	.42	4.36	7.39
1972-73	.26	4.09	5.05

[a] Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Oilseeds and Products* (Washington, D.C.), FOP 4-85, April 1985; FOP 4-84, April 1984; FOP 2-84, February 1984; FOP 11-83, November 1983; FOP 9-83, September 1983; FOP 13-82, November 1982; and *World Crop Production*, WCP 4-85 (Washington, D.C.), April 1985.

Financial Developments Affecting U.S. and World Agricultural Trade

After accelerating sharply in 1984, U.S. economic growth slowed substantially in the first half of 1985 and is expected to continue expanding at only a modest rate through at least the early months of 1986. Since the U.S. has been leading the world economy out of the recession of the early 1980s, slower U.S. economic growth is expected to be a tempering influence on the world economy in the next 6 to 12 months. However, growth rates will continue to differ substantially from one area to another. Continued moderate economic growth is expected in Pacific Rim nations including the Republic of Korea, Japan, Taiwan, Hong Kong, Singapore, and Malaysia. Economies of these nations are expected to be supported by continued strong exports to the U.S. due to the relatively strong dollar and resulting low-cost imports. Recent trends suggest West European economies may continue to experience a relatively slow economic expansion during the next 6 to 12 months, along with slow real economic growth in a number of heavily indebted developing nations.[14] In general, these trends point to a continuation of the recent pattern of relatively slow growth of U.S. and world export demand for agricultural products for at least the next 1 to 3 years.

Key Problem Areas

Global economic prospects for the years immediately ahead are closely related to three problem areas: (1) continued heavy indebtedness of developing nations as well as many private firms and individuals in developed economies, with accompanying large financial needs for debt servicing; (2) a strong U.S. dollar that through mid-1985 had held foreign buyers' costs of imported petroleum and U.S. agricultural products well above levels at the turn of the decade; and (3) high real interest rates (nominal interest minus inflation rate) that add to debt-servicing costs, restrain economic growth, decrease the availability of consumer funds for food purchases, and add to agricultural production, processing, storage, and marketing costs.[15] These three areas are closely interrelated and stem at least partly from U.S. monetary and fiscal policies. U.S. fiscal policy with its large federal budget deficit is highly stimulative to the U.S. economy. As a result, a relatively restrictive monetary policy has been required to control U.S. inflation and restrain the otherwise highly expansionary tendency of government spending and taxation policies. These diverging policies have created a strong U.S. government demand for credit, with resulting high domestic real interest rates.

Since international investment capital moves freely and quickly from one country to another in search of maximum returns, capital movement into the U.S. has been heavy. The strong foreign demand for U.S. dollars for investment purposes has contributed to a rising exchange rate of the dollar against most other currencies since the late 1970s. These foreign capital flows into the United States have assisted in financing the U.S. budget deficit. At the same time, the strong dollar has reduced the cost of foreign products imported into the U.S. and has retarded its inflation rate.

Other nations also have adopted more restrictive monetary policies in the past five years than in the 1970s, in an effort to retard capital outflows to the U.S. Resulting higher interest rates, along with movement of investment capital to the U.S., have tended to hold non-U.S. economic growth well below the levels of the 1970s. At the same time, these interest rates have pushed inflation rates in most industrial nations well below the levels of the previous decade.

From time to time over the past four years, the interrelated problems of debt and high interest rates have caused uneasiness about the health of the U.S. and world banking systems. Concern has developed because of heavy involvement of some leading institutions in loans to developing nations that are experiencing difficulty meeting debt-servicing requirements. The system could be placed under severe pressure in case of widespread defaults on such loans. Other concerns about the banking system from time to time stem from debt burdens of private U.S. firms, as well as investment losses stemming from volatile interest rates and/or currency exchange rates. However, developing nations appear to be making gradual progress in reordering their economies to meet debt-servicing requirements, and concern over the international banking system appears to be diminishing somewhat at this writing.

Debt Burdens of Developing Nations

Recent estimates of outstanding external debt in several developing nations are shown in Table 19. The three most heavily indebted developing nations include Brazil, Mexico, and Argentina, along with substantial debt burdens in Eastern Europe and several oil exporting nations. In Latin America, adjustments to debt burdens have generally involved a four-dimensional approach: (1) reduced government spending; (2) restructuring debts to lengthen repayment periods; (3) reducing nonessential imports; and (4) taking steps to increase exports. After severely reduced real economic output in many Latin American countries in the early 1980s, many nations in the region are now beginning to experience slightly positive real economic growth.[16] At the same time, however, increased exports of such countries as Brazil and Argentina are creating increased competition for U.S. agricultural exports. Heavily indebted nations are under strong pressure to restrain imports and increase exports to meet debt-serving costs. These pressures would be somewhat reduced with lower interest rates and a resulting decline in debt-servicing costs.

Table 19. Estimated Outstanding Debt of Selected Nations in Billions of U.S. Dollars in 1984.[a]

	Total External Debt
S. Korea	35.0[c]
Poland	26.3[d]
Indonesia[b]	21.9[c]
Philippines	28.0[d]
Nigeria[b]	10.0[c]
USSR[b]	28.7[d]
Iran[b]	7.2[d]
Iraq[b]	5.3[d]
Israel	14.6[d]
Argentina	48.0
Bolivia	3.2
Brazil	101.8
Columbia	10.8
Costa Rica	4.1
Chile	18.4
Dom. Rep.	2.9
Ecuador	6.9
El Salvador	2.3
Guatemala	1.9
Haiti	.6
Honduras	2.3
Mexico[b]	95.9
Nicaragua	3.9
Panama	3.6
Paraguay	1.6
Peru	13.5
Uruguay	4.7
Venezuela[b]	34.0

[a] Source: *Wall Street Journal*, (Chicago, Illinois), various issues and *Journal of Commerce*, (New York, New York), May 6, 1985.
[b] Oil exporting nations
[c] 1982 Debt Levels
[d] 1983 Debt Levels

United States agriculture has an important stake in the resolution of developing country debt problems. Widespread threat of default on debts by developing nations would cause lenders to be extremely reluctant to extend new credit to such countries. That, in turn, would reduce their ability to import agricultural and industrial products, and would further curtail economic activity and aggregate world demand. Lending institutions faced with the problem of covering losses from such defaults would likely raise interest rates to credit-worthy customers to increase operating margins. This too would retard global economic activity and depress agricultural as well as industrial trade.

Heavy indebtedness of nations is only part of the current global debt problem. Numerous private firms face similar situations. These debt burdens have their origins in the inflationary world economy of the 1970s. With the shift to variable currency exchange rates, individual countries had greater flexibility to pursue individual monetary policies. If a country's inflation rate accelerated, it was compensated for by changing exchange rates. Strong upward pressure on energy costs added to inflationary pressures and, in some cases, was compensated for by expansionary monetary policies and a resulting decline in currency values. Until the late 1970s, these adjustments occurred with very low or negative real interest rates that encouraged the accumulation of large debts. Inflationary expectations also encouraged the buildup of debts, with borrowers planning to repay such debts later with lower-valued dollars or other currencies. This process transferred wealth to borrowers from savers, lenders, and those with fixed incomes. In the early 1980s, monetary policy in the U.S. and other major industrial nations shifted abruptly toward a halting of the upward spiral of inflation and toward slowing this wealth transfer process. In addition, U.S. monetary regulations were eased to allow U.S. interest rates to fluctuate freely with changing monetary supply and demand conditions. These changes abruptly shifted real interest rates to relatively high and variable levels, and sharply increased the costs of servicing outstanding debt. The net result was reduced global inflation rates and slower economic growth along with substantial and sometimes severe adjustment problems for heavily indebted nations, firms, and individuals.

Several more years appear likely to be required to fully resolve these problems, as borrowers and lenders work together to extend debt repayment periods. Other tools being used to deal with the debt problem include improving the productivity of the economy or firm involved, reducing new public and private borrowings to minimal levels, restraining imports of nonessential items, and taking steps to encourage exports. While these adjustment problems are not insurmountable, they remain serious and appear likely to continue as a major restraint on growth of world and U.S. agricultural exports during the next one to three years. However, progress is being made with the debt problem and a gradually accelerating world economy should generate at least slight growth in trade during this adjustment period.

Currency Exchange Rates

Table 20 shows the impact of a strong U.S. dollar through mid-1985 on foreign buyers' costs of purchasing U.S. corn and soybeans. For example, second quarter 1985 Chicago cash corn prices were nearly the same level as in the third quarter of 1980. However, the Chicago price during the second quarter of 1985, when converted to Japanese yen, was 18 percent above the late 1980 period. Comparable increases for other nations included 50 percent for South Korea, 14 percent for Taiwan and 1,001 percent for Mexico. In short, the strong dollar has placed upward pressure on foreign buyers' costs of purchasing U.S. farm products.

As noted in the fourth edition of this report, the EC has a complex policy that largely insulates its domestic grain users from fluctuations in the dollar's exchange rate.[17] However, its soybean users, as well as those in nearly all other foreign markets, are directly affected by changes in the value of the U.S. dollar relative to other currencies. As an indication of exchange rate impacts on foreign users of U.S. soybeans, the Chicago price of soybeans in the second quarter of 1985 when converted to the Dutch guilder was 63 percent above the third quarter of 1980. Comparable increases for other currencies included 123 percent for the Spanish peseta, 71 percent for the U.K. pound, 59 percent for the West German mark, and 4 percent for the Japanese yen. Chicago soybean prices in U.S. dollars in the second quarter of 1985 were about 9 percent below the third quarter of 1980.

These comparisons are based on nominal exchange rates without adjustments for differences in inflation among countries. Inflation rates for some nations shown in Table 20—such as West Germany and Japan—have been slightly below those of the U.S. during the five-year period compared here.[18] For these countries, inflation-adjusted exchange rates would reveal a larger increase in real costs of purchasing U.S. farm products than shown here. For others with extremely high inflation rates such as Brazil and Mexico, adjustments for inflation would cancel out a sizable part of the increased costs shown in Table 20. For much of Western Europe, which is by far the largest foreign market for U.S. soybeans and soybean products, weakness in exchange rates of local currencies during the 1980 to mid-1985 period substantially exceeded differences between local inflation rates and those of the U.S. Thus, the strong dollar has added significantly to foreign buyers' costs of purchasing U.S. soybeans.

The USSR, which is a major and highly variable importer of grain and protein meal, has a currency not readily convertible to U.S. dollars or other widely accepted hard currencies. Its availability of foreign exchange for imports of farm products depends more on the price of gold than on the dollar's exchange rate, because USSR is a net exporter of gold, which it uses to pay for imports of other products. Over the longer run, gold prices and the U.S. dollar's exchange rate in foreign currency markets tend to vary inversely. In periods of rapid U.S. inflation and a depreciating U.S. dollar, investors often look to gold as a hedge against inflation. Increased demand for gold in such times tends to strengthen its price in dollars. In periods of low U.S. inflation and high interest rates, financial traders are discouraged from investing in gold and its price tends to decline. Thus, Soviet purchasing power indirectly tends to be related to the value of the U.S. dollar.

The strength of the dollar during the first half of the 1980s has resulted from a complex set of domestic and international policy developments.[19] Important factors include U.S. monetary and fiscal policies leading to high real interest rates during the 1979-85 period and the importance foreign investors place on political stability and safety of investments in the United States. In a very real sense, strength of the dollar in the early 1980s canceled out much and, in some cases, all of the trade advantage that

U.S. agriculture obtained from a depreciating dollar during the previous decade. Thus, exchange rates are a major factor behind the recent decline in U.S. agricultural exports.

Future trends in the value of the U.S. dollar relative to other foreign currencies will depend heavily on the fiscal and monetary policies the U.S. pursues during the next one to two years. At this writing, U.S. policies appear to be shifting in a direction that would stabilize or slightly weaken the dollar.

Table 20. Chicago Cash Corn and Soybean Prices in U.S. Dollars per Bushel and Foreign Currency Equivalents 1977 and 1980-85.[a]

		Foreign Prices[d]						Foreign Prices[d]						
Year	Quarter[b]	Chicago Cash Corn[c]	Brazil (Cruzeiro)	Japan (Yen)	Mexico (Peso)	Rep. Korea (Won)	Taiwan (Dollar)	Chicago Cash Soybean	Italy (Lira)	Japan (Yen)	Netherlands (Guilder)	Spain (Peseta)	U.K. (Pound)	W. Germany (Mark)
1985	II	2.91	12425.6	729.0	707.1	2475.2	115.2	5.97	11731.1	1495.5	20.7	1025.6	4.8	18.4
	I	2.75	8146.9	691.4	616.0	2261.9	108.4	5.78	11172.7	1453.1	20.55	1008.8	5.0	18.2
1984	IV	2.80	6189.4	690.9	557.2	2283.1	109.5	5.90	11192.3	1455.8	20.3	1005.4	4.8	18.1
	III	3.61	6039.5	856.8	725.6	2885.1	143.9	7.34	12544.1	1742.1	23.0	1155.7	5.4	20.4
	II	3.69	4824.7	829.0	647.6	2921.0	147.4	7.89	12754.0	1772.5	23.1	1171.7	5.5	20.5
	I	3.25	3147.6	755.1	549.3	2592.2	130.9	7.90	13224.6	1835.6	24.5	1251.4	5.5	21.8
1983	IV	3.49	2509.3	826.3	547.9	2756.4	140.1	8.46	13536.0	2002.9	25.0	1285.9	5.6	22.3
	III	3.25	1764.7	776.8	484.6	2492.8	129.9	6.16	9270.8	1472.2	17.5	894.7	4.0	15.6
	II	3.22	1341.1	768.9	492.7	2457.5	129.1	6.40	9222.8	1528.8	17.5	873.6	4.3	13.7
	I	2.46	610.6	565.8	[e]	1833.2	99.8	5.67	7756.6	1304.1	14.8	712.4	3.5	13.4
1982	IV	2.06	415.7	553.5	[e]	1529.9	81.5	5.19	7369.8	1394.6	14.3	591.4	3.1	13.1
	III	2.67	452.6	680.3	128.4	1977.1	104.0	6.18	8571.7	1574.7	16.8	689.4	3.6	15.2
	II	2.63	388.9	646.2	119.9	1862.0	97.3	6.37	8402.0	1565.1	17.0	681.5	3.6	15.3
	I	2.54	311.4	556.0	66.7	1753.6	96.3	6.12	7307.3	1339.7	15.1	590.5	3.2	13.7
1981	IV	2.53	258.5	589.9	63.8	1733.1	96.1	6.21	7346.3	1447.9	16.1	597.5	3.3	14.4
	III	3.32	302.0	756.5	81.2	2267.9	121.1	6.91	8271.3	1574.4	18.5	666.0	3.7	16.7
	II	3.50	266.5	744.1	83.2	2340.5	125.4	7.60	7957.2	1615.8	17.7	646.0	3.4	16.0
	I	3.66	233.8	740.8	84.7	2419.3	131.2	7.98	7461.3	1615.2	17.1	632.8	3.4	15.8
1980	IV	3.37	187.0	701.1	77.6	2006.0	121.3	7.73	6647.8	1608.2	15.2	566.2	3.2	14.0
	III	2.81	144.6	616.8	64.2	1653.0	101.2	6.57	5525.4	1442.1	12.7	459.9	2.8	11.6
	II	2.55	118.8	651.3	58.1	1168.8	91.4	5.64	5132.4	1440.5	12.0	414.0	2.6	11.1
	I	2.63	111.3	625.4	59.9	1249.3	93.9	6.17	4938.5	1467.2	11.7	407.8	2.8	10.5
1977	IV	1.84	27.5	479.3	41.7	876.2	69.4	5.11	4502.2	1331.1	12.5	431.2	2.9	11.7
	III	2.14	30.6	571.3	49.4	1019.0	80.8	6.95	6145.0	1855.3	17.2	484.3	4.0	16.3
	II	2.52	32.5	693.3	56.8	1200.0	95.1	9.08	8056.8	2497.9	22.6	621.9	5.3	21.7
	I	2.51	30.8	733.9	48.9	1195.2	94.7	6.94	6061.1	2029.3	16.9	473.4	4.1	16.3

[a] Sources: *Statistical Annual Chicago Board of Trade* (Chicago: Chicago Board of Trade), various issues; United States Department of Agriculture, Agricultural Marketing Service, *Grain and Feed Market News* (Independence, Missouri), various issues; and *Wall Street Journal* (Chicago, Illinois), various issues.

[b] All prices were quoted as of the first trading day of the quarter.

[c] Hopper car corn bids.

[d] Does not include transportation or transaction costs.

[e] Mexican pesos were not traded at these times due to the peso crisis.

Trends in African Food Production and Imports[20]

Africa is the center of the world's most serious food problems. With widespread drought across much of the continent in the early 1980s, a lack of reserve grain stocks, extremely low per capita incomes, and very limited aggregate purchasing power, famine reached epidemic proportions in several areas of Africa in 1984 and 1985. The African food problem reflects a combination of many factors including climatic limitations, inadequate transportation, marketing and storage systems, government policies, social structures, inadequate research and plant breeding with crops most suited to African conditions, and numerous socioeconomic conditions restraining the use of fertilizer, irrigation, and other currently available technology.

In Africa, adequacy of food supplies and dietary trends vary by regions. With a few exceptions, Northern and Southern Africa have been making progress in food production and have much more adequate diets than the central section of the continent. Food shortages and lack of improvement in domestic food production have been most severe in a group of countries in and immediately below the Sahara desert. A review of trends in grain production, yields, imports, population, fertilizer use, and irrigation shows a few of the elements behind the African food crisis.

Population Growth Trends

A prominent feature of Africa's economy is its rapid population growth rate. At 2.9 percent per year, the continent has one of the highest population growth rates in the world. Total African population rose from 342.5 million people in 1970 to 510.6 million people in 1983. Its present population is about two and one-third times that of the U.S. As Table 21 indicates, growth rates vary substantially from region to region (see Figure 30 for regional delineations).

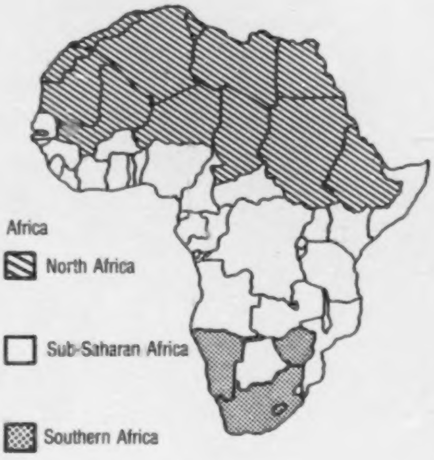
Southern Africa's population growth rate has been more rapid than that of other regions, with an annual average growth of 3.4 percent since 1970. Sub-Saharan African countries experienced the second highest growth rate at 3.2 percent per year. Northern African population grew much more slowly, with a 2.3 percent annual growth rate. Rapid population growth has provided a major challenge for African agriculture and related sectors in recent years.

Table 21. African Population by Region, Selected Years, 1970 through 1983.*

	(Millions of People)								Avg. Annual Rate of Growth
Region	1970	1972	1974	1976	1978	1980	1982	1983	1970-83
Northern	124.9	131.0	138.0	139.4	150.5	158.7	167.6	172.4	2.3
Southern	25.8	29.2	30.9	32.8	35.6	37.7	40.0	41.2	3.4
Sub-Saharan	191.8	207.2	218.4	232.4	252.6	270.3	287.8	297.0	3.2
Africa, total	342.5	367.4	387.3	404.6	438.7	466.7	495.4	510.6	2.9

*Source: Food and Agriculture Organization of the United Nations, *Production Yearbook* (Rome, Italy), various issues.

Figure 30. Geographic Divisions for Africa.



Much of Africa's population is located in Sub-Saharan countries, with that area accounting for 58 percent of the continent's total population. Southern Africa is more sparsely populated and accounts for 8 percent of the total population, with the remaining 34 percent being in North Africa.

Grain Production Trends

During the 1970-83 period, the harvest of major cereal crops in Africa averaged 41.6 million metric tons annually. Production at that level is equivalent to only 13 percent of a normal U.S. grain crop. Average production of individual grains included 24.8 million tons of corn (maize), 9.04 million metric tons of wheat, and 7.7 million metric tons of rice. Combined production of these three crops during the 1970-82 period grew at an average rate of 2.17 percent per year, thus lagging substantially behind population growth. Total land area devoted to these crops increased at a 1.13 percent average growth rate per year, while yields per hectare rose by an average of 1.02 percent annually over the same period.

Corn

Production of the most important cereal crop in Africa increased at a 2.75 percent annual growth rate over the 1970-82 period. Land devoted to corn increased by about 1.3 percent per year along with an average increase in yields of 1.41 percent annually. The Sub-Saharan region traditionally has been the largest producer of corn on the African continent, with production in that region averaging 10.3 million metric tons yearly, and accounting for about 42 percent of Africa's total corn production. Production in Sub-Saharan countries rose by an average of 2.7 percent per year during the 1970s and early 1980s, with the harvested area increasing by 2.2 percent yearly during the same period. Corn yields in Sub-Saharan Africa have trended upward by 0.53 percent per year during the 1970-82 period. Thus, an increase in area devoted to corn has been the primary reason for the increase in production in major producing countries such as Nigeria, Tanzania, Zaire, Kenya, and Malawi. By contrast, production declined in several less important corn producing countries including Botswana, Cameroon, Cape Verde, Guinea, and Lesotho.

Southern Africa ranks second in corn production on the continent, with average annual production of 10.1 million metric tons over the 1970-83 period. This region accounts for about 41 percent the total African corn crop. Southern African corn production has shown a stronger upward trend than in other areas, with an annual growth rate of 3 percent from 1970 to 1982. Growth in output there was due almost entirely to increased yields per hectare.

Corn production in North Africa is much smaller than in the other two regions, with production averaging 4.36 million metric tons per year in the 14-year period ending in 1983. North African countries, as a group, had an average upward trend in production of 2.5 percent per year, with land area in corn increasing by 0.8 percent and yields per hectare increasing at an average of 1.7 percent annually. Egypt is the largest corn producer in North Africa.

By western standards, average corn yields in Africa are extremely low. The average yield for the continent as a whole over the 1970-83 period was 1,292 kilograms per hectare, compared with the world average of 2,951 kilograms per hectare and a U.S. average yield of 5,795 kilograms per hectare. In all three regions, long-term growth in corn production and yields has lagged well behind population growth.

Wheat

Wheat is the second most important grain produced in Africa. Production of this crop averaged 9.3 million metric tons per year over the 1980 through 1983 period. Total output rose by an average of 1.9 percent annually during the period from 1970 through 1982, with land devoted to wheat decreasing by 0.4 percent per year and the yields increasing by 2.3 percent annually.

Africa's wheat production is concentrated largely in northern countries, with that region's average crop of 6.7 million metric tons representing about three-fourths of the continent's total production. North Africa's wheat production has trended upward in recent years despite declining area devoted to the crop. Production rose by 1.1 percent annually, while land devoted to wheat decreased by an average of 1.3 percent per year in the 1970s and early 1980s. At the same time, yields rose by an average of 2.5 percent. North African countries with relatively low yields include Algeria, Tunisia, and Ethiopia.

Southern Africa ranks second on the continent in wheat production with average output of 2.2 million metric tons annually. This area has experienced moderate growth in wheat production in recent years, due largely to an increased area devoted to wheat. Annual growth in Southern Africa's wheat production in recent years has averaged 4.8 percent, with an upward trend in yields of 1.4 percent per year. South Africa is the major wheat producer in this region.

Wheat production in Sub-Saharan countries is extremely low, averaging only 0.35 million metric tons annually. Wheat production there grew at 0.9 percent per year over the 1970-82 period. Wheat yields in Sub-Saharan Africa rose by an average of 2.4 percent yearly while the harvested area decreased by 1.5 percent per year over the same period.

Wheat yields in African nations as a group at 1,075 kilograms per hectare also are sharply below the world average yields of 1,770 kilograms per hectare and the U.S. average yield of 2,194 kilograms per hectare. Only Egypt, with wheat yields of 1,845 kilograms per hectare and Morocco with 1,827 kilograms per hectare, exceeded the world average level during the 1970-83 period.

Table 22. Production of Wheat, Rice, and Corn in Africa by Region, Selected Years, 1970 through 1983 in Millions of Metric Tons.[a]

Region	1970	1972	1974	1976	1978	1981	1982	1983
Northern Total	13.1	14.0	13.3	15.0	13.8	12.1	15.4	14.8
Rice	2.9	2.8	2.4	2.7	2.7	2.5	2.7	2.7
Wheat	6.3	7.4	6.8	7.6	6.5	6.1	7.3	6.7
Corn	3.9	3.9	4.1	4.7	4.6	3.5	5.4	5.5
Southern Total	8.3	13.0	14.9	11.1	13.5	20.0	12.7	6.9
Rice[b]	0	0	0	0	0	0	0	0
Wheat	1.4	1.8	1.7	2.3	1.9	2.5	2.6	1.9
Corn	6.8	11.2	13.2	8.7	11.6	17.4	10.0	5.0
Sub-Saharan	13.4	14.3	14.9	16.9	16.8	17.5	17.9	17.4
Rice	4.6	4.2	4.8	5.2	5.6	5.4	5.5	5.5
Wheat	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.2
Corn	8.5	9.8	9.7	11.3	10.8	11.7	12.0	11.8
Total Africa	34.8	41.3	43.0	43.0	44.2	49.6	45.9	39.1
Rice	7.4	6.9	7.2	7.9	8.3	7.9	8.2	8.1
Wheat	8.2	9.5	8.8	10.3	8.8	9.1	10.4	8.7
Corn	19.2	24.8	27.0	24.8	27.0	32.7	27.4	22.2

[a] Source: Food and Agriculture Organization of the United Nations, *Production Yearbook* (Rome, Italy), various issues.

[b] Less than .05 million metric tons.

Rice

Rice is a less important crop in Africa than either maize or wheat, with average production of 8.1 million metric tons per year during the 1980-83 period. Production of this crop rose at an average annual rate of 0.7 percent per year from 1970 through 1982. Thus, growth in African rice production has lagged well behind that of maize and wheat, and sharply behind the continent's population growth. Harvested rice area has increased by 3.4 percent per annum year in recent years, with yields declining by 2.6 percent annually over the same period.

Production in Sub-Saharan countries averaged 5.5 million metric tons per year during the 1980-83 period, with an average annual growth rate of 1.4 percent since 1970. Harvested rice area in this region expanded by 4.14 percent per year, with yields declining by an average annual rate of 2.7 percent over the 1970-82 period. Major rice producing countries in Sub-Saharan Africa include Guinea, Guinea-Bissau, Ivory Coast, Liberia, Madagascar, Nigeria, Sierra Leone, Tanzania, and Zaire. North African production averaged 2.7 million metric tons annually over the 1970-83 period. In this region, rice production decreased by 0.5 percent per annum during 1970-82. As with other grains, Africa's average rice yields remain far below the world average.

Fertilizer Use in Africa

Extremely limited fertilizer utilization is one of many factors contributing to low grain yields in Africa. For example, fertilizer consumption in Northern African nations ranged from an average of 0.5 kilograms per hectare in Mauritania to a high of 334.6 kilograms per hectare in Egypt in 1982. Consumption in many Sub-Saharan nations ranged from 1.0 to 8.0 kilograms per hectare, with some using virtually no fertilizer at all.

Table 23. African Grain Imports by Region in Millions of Metric Tons, 1970 and Yearly Average 1980-83.[a]

Grain/Region	1970	1980-83	Percent Change 1970 to 1980-83
Corn			
N. Africa	.10	2.03	+1930
S. Africa	.20	.37	+85
Sub-Saharan Africa	.41	1.46	+256
Total[b]	.71	3.87	+445
Rice			
N. Africa	.05	.25	+400
S. Africa	.08	.16	+100
Sub-Saharan Africa	.65	2.43	+274
Total[b]	.78	2.84	+264
Wheat and Wheat Flour, Wheat Equivalent			
N. Africa	2.79	14.54	+421
S. Africa	.18	.14	−22
Sub-Saharan Africa	1.44	3.52	+144
Total	4.41	18.19	+312

[a] Source: Food and Agriculture Organization of the United Nations, *Trade Yearbook* (Rome, Italy), various issues.

[b] Totals may not add up due to rounding.

Irrigation Use Limited

Irrigated land is a significant factor in agricultural production only in a few African countries including Egypt, Libya, Morocco, Sudan, Tunisia, South Africa, Madagascar, Mali, Senegal, and Somalia. In 1982, irrigated land on the continent totaled approximately 8.3 million hectares. About 71 percent of the total irrigated land was in North Africa, with 14 percent in Southern Africa and 15 percent in the Sub-Saharan region. Land under irrigation in Africa expanded at a rate of 1.3 percent annually over the 1970-82 time period.

Trends in African Grain Imports

African grain imports have trended upward during the last one and one-half decades as population growth exceeded the growth of domestic cereal production. Combined annual imports of rice, wheat, and maize averaged 24.9 million metric tons during 1980-1983, more than four times the 5.9 million ton level in 1970. Increases in imports of rice, wheat, and maize were highest in North African countries with 472 percent increase since 1970. Southern Africa total cereal imports rose by 46 percent during the same period, along with a 196 percent increase in Sub-Saharan nations. The sharpest growth in imports was in corn (see Table 23) with a large part of the increase being imported by North African nations.

African Diets vs. Dietary Energy Standards

Table 24 shows rankings of average diets in African nations as percentages of nutritional energy requirements. This standard represents only a partial measurement of adequacy of diets since it does not take into account other dietary requirements. These measures show 16 Sub-Saharan nations with average diets below energy standards during the 1978-80 period, along with two countries in Southern Africa and five in Northern Africa. In some areas, dietary levels have deteriorated further since 1980. While these data are crude measures of the African food problem, they indicate the problem is concentrated in Sub-Saharan nations and a few countries bordering this area.

Table 24. Percentage of per Capita Standard Dietary Energy Requirements Available in Average Diets of Selected African Nations[a]

Region and Country	1967-69	1975-77	1978-80
	(Percentage of U.N. Dietary Energy Standards)		
Northern			
Algeria	77	94	100
Chad	97	75	76
Egypt	101	114	118
Ethiopia	87	77	74
Libya	101	135	145
Mali	88	84	85
Mauritania	89	81	89
Morocco	98	109	110
Niger	90	86	94
Sudan	84	95	101
Tunisia	93	111	115
Southern			
S. Africa	111	119	115
Namibia	100	98	98
Zimbabwe	87	88	80
Selected Sub-Saharan			
Angola	83	91	90
Benin	95	92	100
Botswana	85	88	94
Burundi	95	92	92
Cameroon	90	105	106
Congo	94	100	99
Gabon	93	113	122
Guana	96	93	88
Guinea-Bissau	88	99	102
Ivory Coast	111	107	114
Kenya	97	93	89
Liberia	98	102	107
Madagascar	105	109	107
Malawi	92	97	96
Mauritius	104	115	119
Mozambique	89	84	81
Nigeria	92	95	99
Reunion	108	119	128
Sierra Leone	97	91	92
Somalia	96	96	92
Swaziland	92	100	108
Uganda	95	84	80
Upper Volta	85	85	85
Tanzania	88	91	87
Zaire	99	102	96
Zambia	93	95	86

[a] Source: Food and Agriculture Organization of the United Nations, *The State of Food and Agriculture 1982* (Rome, Italy), 1983.

Three Success Stories in Grain Production: EC, China, and India

During the 1970s, the world grain trade was shocked by the emergence of several countries and regions as large importers of grain. Included in this category were USSR, China, Eastern Europe, and Mexico. Some nations in this group had been significant grain exporters in the past. In the early 1980s, an opposite shift occurred as three formerly large grain importing regions moved to an exporting position. Even more significant, the three areas involved (EC, China, and India) are densely populated and represent nearly half of the world's population.

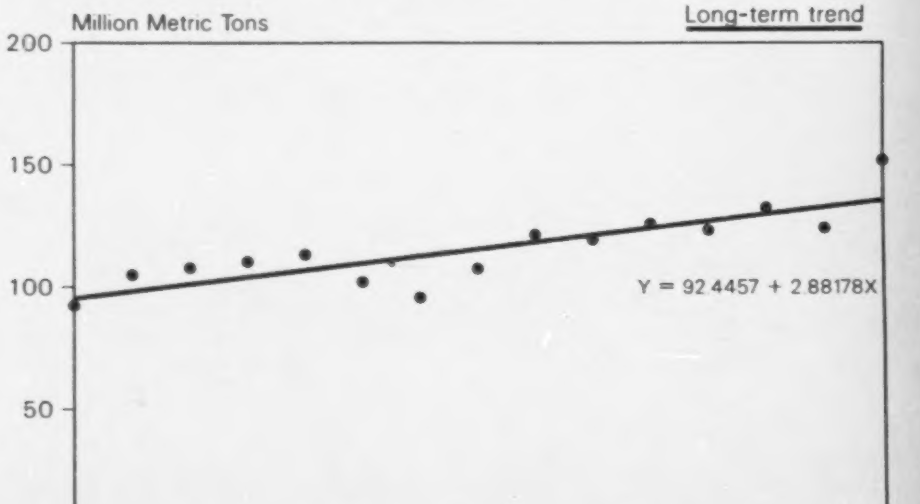
The EC in the 1960s and 1970s was the largest foreign market for U.S. coarse grains and also purchased large quantities of U.S. wheat, soybeans, and soybean meal. But by 1984-85, EC had become a net coarse grain exporter and drastically reduced its imports of U.S. corn, soybeans, and soybean products as well as wheat. China had emerged as a significant grain and soybean oil importer in the mid-1970s in an effort to maintain and improve the diets of its population of approximately one billion people. India, at times during the mid-1960s and 1970s, experienced serious food problems and imported large volumes of U.S. wheat and other farm products. But by 1984-85, both India and China were exporting modest quantities of grains and oilseeds or oilseed products to other Far East nations. Trade sources indicate these two countries also may have exported some grain and protein meal to USSR in 1984-85.

European Community

Figure 31 shows the trend in total grain production in EC since 1970. The EC's grain production grew rapidly during the late 1970s and early 1980s in response to favorable weather, incentives for heavy fertilizer usage provided by high internal price supports, and new high yielding hybrid wheat varieties. In some cases, these new varieties were developed specifically for livestock and poultry feeding. With a higher protein content than corn, replacement of corn with wheat in EC nations has reduced the community's corn and soybean meal imports.

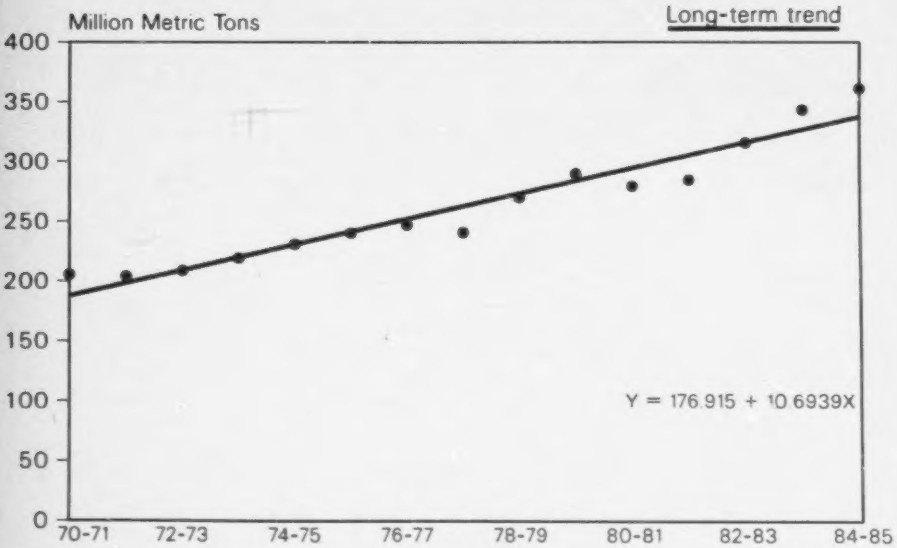
Average wheat yields in some EC countries have been as high as 90 to 105 bushels per acre in recent years, compared with 1984 U.S. average wheat and corn yields of 38.8 and 106.6 bushels per acre, respectively. Much of the potential gain in EC grain production from currently available technology has already been realized and is likely to hold EC grain production at high levels in the years ahead. With a slowly expanding population and per capita livestock and poultry product consumption at high levels, EC domestic grain production appears likely to expand modestly in the years ahead. That combination appears likely to hold EC grain exports at high levels in the late 1980s and early 1990s, provided weather conditions remain favorable. Thus EC will probably remain a major competitor of U.S. in world agricultural export markets.[21] It also is doubtful that U.S. will be able to regain its former volumes of corn, soybean, and soybean product exports to EC in the foreseeable future.

Figure 31. Trend in EC-10 Grain Production 1970-71 to 1984-85.



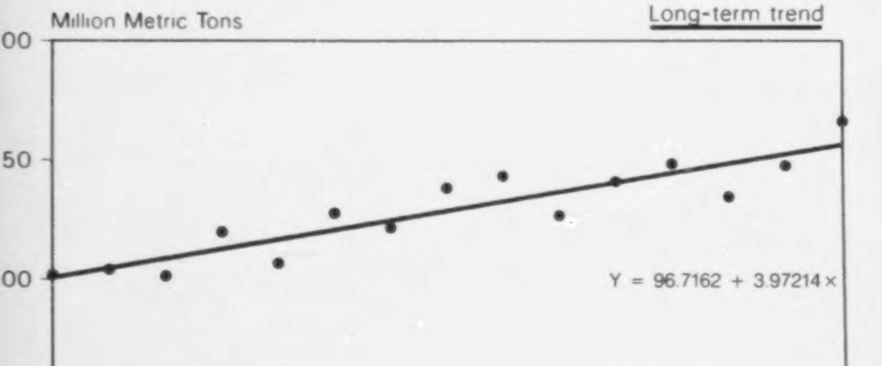
Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains* (Washington, D.C.), FG 7-77, July 197; FG 20-78, November 1978; FG 24-79, December 13, 1979; FG 5-80, February 1980; FG 4-81, January 1981; FG 13-82, April 26, 1982; FG 26-83, September 9, 1983; and FG 7-85, May 1985.

Figure 32. Trend in Chinese Grain Production, 1970-71 to 1984-85.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains* (Washington, D.C.), FG 6-85, April 1985 and various other issues.

Figure 33. Trend in Indian Grain Production 1970-71 to 1984-85.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains* (Washington, D.C.), FG 9-76, May 1976; FG 20-78, November 1978; FG 5-80, February 1980; FG 4-81, January 28, 1981; FG 13-82, April 26, 1982; FG 26-83, September 9, 1983; FG 19-83, November 8, 1983; FG 2-85, January 1985; and FG 7-85, May 1985.

China

China's grain production has grown at an accelerating rate since the mid-1970s through the combined effects of increased use of technology and changes in its economic system (see Figure 32). Technological developments include the construction of a large number of new fertilizer plants and increased use of fertilizer, improved varieties, and changes in government policies to encourage research. In the late 1970s, China also changed its economic system to allow farm workers greater freedom in managing production and to provide individual economic incentives to farm workers to market excess production in return for cash payments.[22]

Future trends in Chinese grain and soybean exports will depend on China's ability to generate further technological improvements in production through its expanded agricultural research program, as well as trends in urban food consumption patterns. An expected upward trend in Chinese per capita income and a likely increase in consumption of meat and poultry may moderate the expansion of Chinese grain and oilseed exports and could eventually return that nation to an importing position.

India

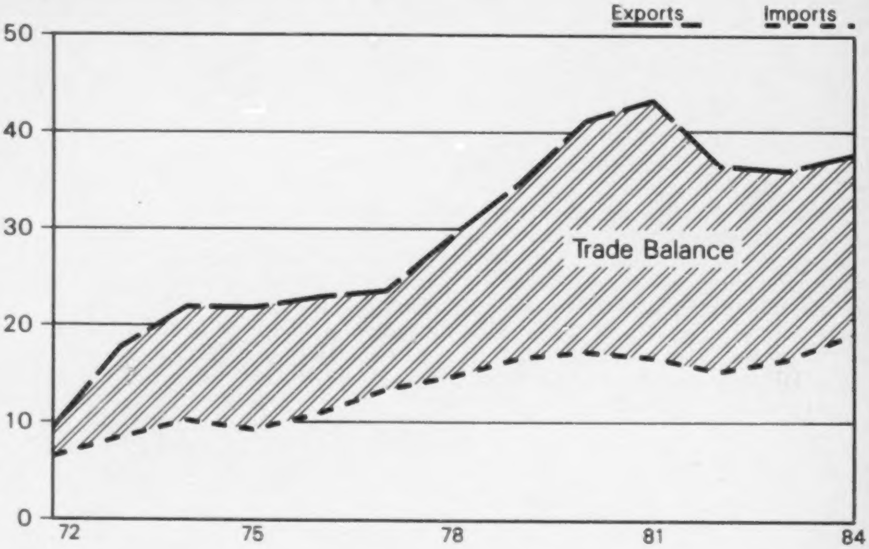
India is the second most populous nation in the world. Its climate has been somewhat more variable than that of China and EC, partly because Indian grain production is heavily dependent on monsoon rains. As shown in Figure 33, India has made impressive strides in grain production in recent years through the use of improved technology. Grain production has been increased by higher yielding varieties, expanded use of fertilizer and irrigation and improved management. These same factors appear likely to push Indian grain production irregularly higher in the next few years. But, with its population of over 700 million people and somewhat variable weather patterns, it seems likely that India will continue to alternate from a grain exporting to an importing position from time to time from now through the early 1990s.

U.S. Agricultural Exports Up in 1984 but Ag Trade Balance Declines

The 1984 calendar year generated a 4.8 percent rise in the total value of U.S. agricultural exports, reversing a downtrend that has been in effect since 1981 (see Figures 34 and 35). The increase reflected higher prices than a year earlier for grains, oilseeds, and several other major farm products. Higher prices were due largely to a severe 1983 drought and the government Payment-In-Kind (PIK) Program, which sharply curtailed crop production and reduced total U.S. supplies during the first nine months of 1984. For the U.S. agricultural sector, the increased value of agricultural exports was a welcome change from the downward spiral of the past two years. However, the less encouraging part of the export picture, from the viewpoint of U.S. producers and agribusiness firms, was that total volume of agricultural exports remained sharply below peak levels of the 1979-81 period and rose only 1 percent from the previous year. The volume of exports continued to be restrained by large competing supplies of farm products in other nations, as well as by international financial problems noted in the previous section and the strong U.S. dollar.

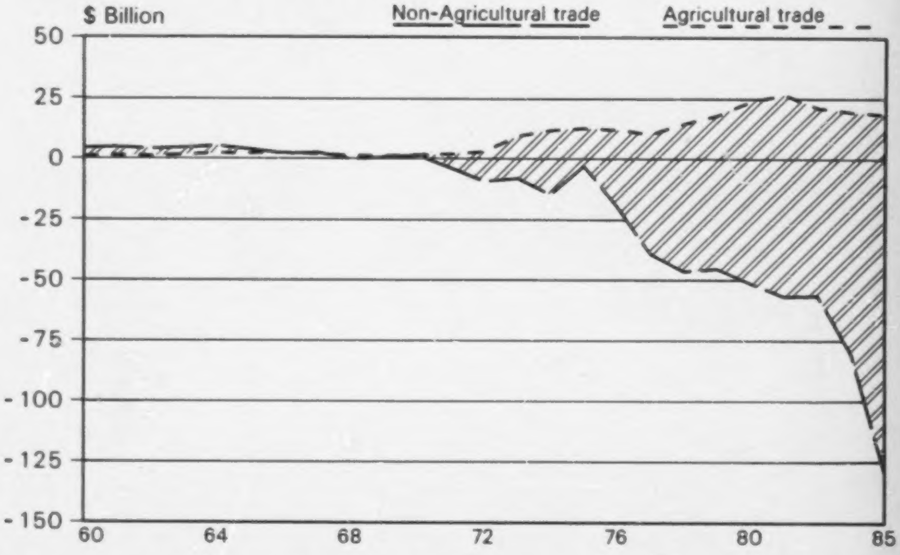
U.S. agricultural imports also increased in 1984. Total U.S. agricultural product imports reached a record $19.3 billion, up an unusually sharp 17 percent from the previous year, as a result of the strong U.S. dollar. With agricultural exports at $37.8 billion, that left a net U.S. agricultural trade balance of $18.5 billion, $1.1 billion less than in 1983. The surplus U.S. agricultural trade balance continues to be important not only to the farm and agribusiness sectors of the U.S. economy, but also the national economy as a whole. The positive agricultural trade balance, in a very real sense, continues to provide foreign exchange earnings to help pay for imported petroleum, raw materials, industrial goods, and other products that contribute to the economic well-being of the U.S. population. However, the U.S. nonagricultural trade balance continued to deteriorate sharply in 1984 to the point where its deficit position is now far larger than the surplus balance in the agricultural sector (see Figure 35). The huge deficit in the nonagricultural sector reflects serious imbalances in U.S. monetary and fiscal policies, and is so large that there is virtually no hope that an improving agricultural trade balance will even come close to offsetting the nonagricultural deficit. Nonagricultural U.S. exports in calendar year 1984 totaled $174.2 billion, 9 percent above the previous year. However, non-

Figure 34. Dollar Value of U.S. Agricultural Exports and Imports, 1972-84 Calendar Years.



Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), January-February 1985 and various other issues.

Figure 35. Net U.S. Trade Balance in Agriculture and Nonagricultural Products by Calendar Years, 1960 through 1985.



Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), January -February 1985 and various other issues.

agricultural imports rose to $303.7 billion, a 26 percent increase from 1983. That left a U.S. nonagricultural trade deficit of $129.5 billion, nearly two-thirds larger than in the preceding year and seven times as large as the agricultural trade surplus.

The extremely large U.S. trade deficit, if it is not dealt with soon, has important implications for U.S. economic growth and interest rates, as well as the economic health of U.S. agriculture and other sectors heavily dependent on exports and/or sensitive to import competition. Policy tools for dealing with this problem will be discussed in a later section of this report. Preliminary indications point to a continued large U.S. trade deficit in 1985 along with at least a modest decline in agricultural exports because of lower commodity prices than a year earlier.

Agricultural exports remain vital to producers, agriculturally based industries, and rural communities, and the downward trend since 1980 is reason for serious concern. Reduced exports are one of several factors behind severe economic pressures in U.S. agriculture and a recent sharp decline in asset values in the U.S. agricultural sector.

For the next several years, given approximately normal weather in major foreign grain producing areas, growth of U.S. agricultural exports may remain well below the sharp upward trend of the 1970s. Several more years of adjustment appear necessary before Eastern Europe, Latin America, and other developing nations fully recover from current debt problems. Even oil-exporting nations are experiencing some of these same economic forces, with reduced availability of funds for farm product imports and expected slower economic growth in the years ahead. Growth rates for U.S. agricultural exports also will depend on future trends in the value of the U.S. dollar. The dollar's exchange rate is influenced by monetary and fiscal policies and their resulting impact on U.S. real interest rates. In addition, any major changes in U.S. grain reserve and price support policies could potentially affect future export growth rates. At this writing, the U.S. political climate appears to be shifting toward a policy stance that will encourage slight to modest long-term agricultural export growth. However, even with significant changes in U.S. monetary, fiscal, and agricultural policies, a time lag will be involved before export growth rates are significantly affected.

U.S. Government-assisted Export Programs: Blended Credit Halted, Export Payment-In-Kind Initiated

In contrast to the 1970s when U.S. government export assistance programs were small, official programs to encourage expanded exports have increased substantially in size in the last few years with the downtrend in U.S. commercial sales. These programs have their origins as far back as the 1920s and in the Agricultural Development and Assistance Act of 1954 (Public Law 480).[23] Originallly they were intended to: (1) assist in disposal of surplus U.S. agricultural commodities; (2) help countries lacking foreign exchange to purchase U.S. agricultural products; and (3) facilitate U.S. foreign aid efforts. In the last 15 years, similar programs have been developed by Western Europe and Japan.[24] And since the beginning of this decade, emphasis in U.S. programs has increasingly shifted toward: (1) assisting nations that are unable to obtain commercial financing; (2) providing more attractive financing arrangements than are commercially available in order to compete with financing terms and/or price advantages offered by other exporting nations; and (3) reducing world hunger.

Types of Assistance Programs

The U.S. has three main types of concessional export programs for agricultural products: PL 480 Title I and Title II and AID programs. The PL 480 Title I Program provides long-term low-interest credit with repayment terms of up to 40 years and a grace period of up to 10 years. Repayments are to be made in U.S. dollars or other currencies readily convertible into dollars. U.S. statutes require three-fourths of all food aid exports under Title I to be sent to countries with a per capita Gross National Product (GNP) of $730 or less per year. Prior to fiscal year 1982, the GNP requirement had been $680 per year.[25] Title II of the PL 480 Program involves food donations for export, with about two-thirds of these exports normally shipped by voluntary relief agencies. In fiscal year 1982, Title II shipments were supplemented by an additional 27 percent contributed from the World Food Program and 9 percent from government-to-government export programs. Until very recently, India was a major recipient of Title II agricultural exports and accounted for slightly over one-fifth of such shipments in fiscal year 1981-82.[26]

The AID (Agency for International Development) Program was begun in 1979 to provide financial grants and loans for agricultural commodity purchases. Since its inception, strong emphasis for such financing was first given to Israel and later extended to Egypt and Sudan.[27] Table 25 and Appendix IV, Table 1 show the distribution of U.S. farm product exports under concessional programs by commodities during the past seven years. These programs have been heavily oriented toward soybean oil, wheat, flour, and nonfat dry milk.

Blended Credit Program Dropped, U.S. Government Loan Guarantees Continued[28]

During the past five fiscal years, the U.S. administration and Congress have given sharply increased emphasis to U.S. government loan guarantees and other non-PL 480 export assistance programs. By the 1983-84 fiscal year, about one-eighth of the total dollar value of U.S. agricultural exports was accounted for by combined shipments under such programs and PL 480 programs, in an effort to halt the downward trend of U.S. agricultural exports. Commodity Credit Corporation (CCC) loan guarantees (GSM 101 and 102 funds) are a cornerstone of the non-PL 480 programs. These funds are used to assist exporting firms in making sales to foreign buyers who have difficulty obtaining commercial credit. With CCC loan guarantees, private lending institutions provide short-term or intermediate-term credit for purchases of U.S. farm products. The CCC, a U.S. government agency, guarantees repayment of the loans and a sizable part of the interest. U.S. Department of Agriculture officials indicate the repayment history on CCC-guaranteed loans generally has been good. However, one exception is Poland. CCC has found it necessary to make some payments on loans to that nation in the past four years because of its severe financial problems. With serious debt problems in many developing nations, some analysts express concern that future repayment rates may be less favorable than in the past.

One important example of the use of CCC-credit guarantees is Mexico. With its severe 1982-83 financial crisis, over $1 billion in CCC credit guarantees were allocated to that nation in fiscal 1982-83 along with sizable allocations the next two years to maintain continued imports of U.S. farm products. Mexico used this financial assistance to purchase U.S. corn, grain sorghum, wheat, soybeans, and other farm products.

In 1982-83, to further encourage U.S. farm product exports, the U.S. government implemented a Blended Credit Program. The program was continued through the middle of the 1984-85 fiscal year before being at least temporarily discontinued. It involved a one-tenth blend of interest-free government loans (GSM 5 funds) and nine-tenths CCC credit guarantees (GSM 102 funds) that normally cover up to 98 percent of the principal and up to 8 percentage points of interest. Major commodity emphasis in the Blended Credit program was given to wheat, flour, and soybean oil. Special effort was made to ensure that blended credit sales were beyond quantities that recipient countries would have purchased without the program. In addition, the program was viewed as a tool for increasing the U.S. share of world food trade and for competing with subsidized sales from the exporters, particularly the European Community. However, full achievement of such objectives requires that competing exporters not respond with their own expanded export incentive programs and that they take action to reduce production and/or store surplus supplies of agricultural products. These response conditions are not met in the Blended Credit Program.

Reason for Halting Blended Credit Program

United States laws require that 50 percent of all U.S. concessional exports of farm products be shipped in American flag ships. Such legislation originally was enacted to help ensure that the U.S. would maintain a viable merchant marine fleet for national defense purposes. In recent years, freight rates for U.S. vessels have been 40 to 80 cents or more per bushel above comparable rates for foreign vessels, with

Table 25. U.S. Concessional Government Agricultural Exports as Percent of Total Exports by Major Commodities, Fiscal Years 1977 and 1979 through 1984.[a]

Commodity Products	1977	1979	1980	1981	1982	1983	1984
Wheat and Flour	17.5	13.0	9.6	7.6	7.4	10.6	8.6
Corn	2.5	3.7	1.9	2.0	1.4	2.3	2.4
Soybean Oil	22.0	17.3	22.0	38.8	27.7	29.3	27.8
Cotton (exc. Linters)	1.2	1.0	.4	.4	.4	.6	.5
Milk, non-fat dry	99.8	83.4	53.4	88.4	27.3	8.7	18.8
Others	4.2	2.6	2.4	2.0	1.2	0.8	1.4

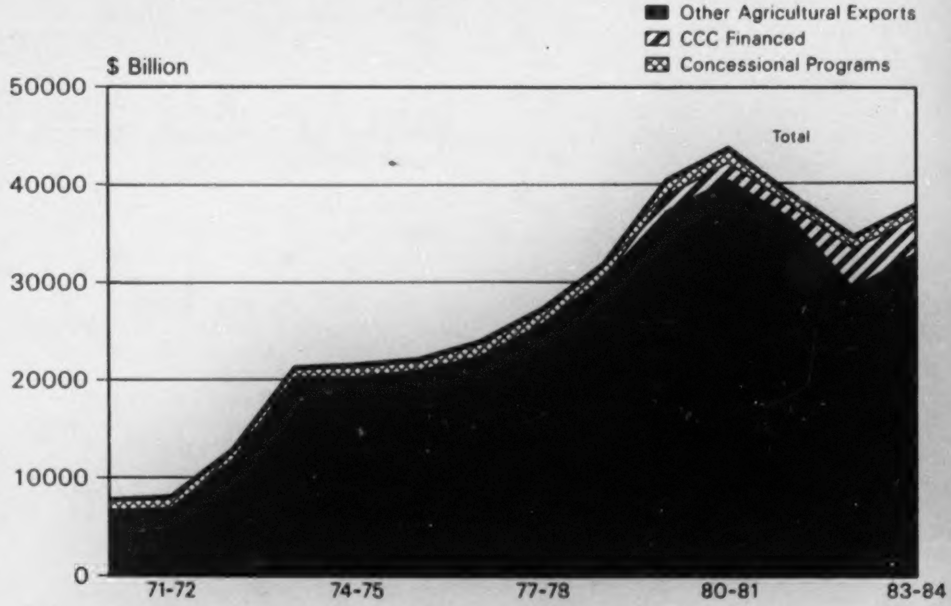
[a] Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), January-February 1985; and various other issues.

the exact differential depending on vessel size, shipping route, destination, and other variables. The 50 percent U.S. flag ship requirement is known as cargo preference and has been applied to PL 480 shipments, but not to the Blended Credit Program until the spring of 1985. Prior to that time, the U.S. Department of Agriculture had considered the Blended Credit Program a commercial sales program rather than a concessional export program. However, a court decision in March 1985 determined that the program involved concessional sales and therefore must meet cargo preference requirements. The added cost of shipping in U.S. vessels would in most cases more than offset any advantages to the foreign buyer from lower financing costs, and would make the program unattractive. As a result, the administration halted sales under the Blended Credit Program.[29] At this writing, efforts are under way in Congress to exempt agricultural commodities from cargo preference requirements; if they are successful, the Blended Credit Program could be reactivated at some future time. In the meantime, the U.S. has initiated an export payment-in-kind program for wheat and flour. With this program, selected foreign nations are given bonus quantities of these commodities after making initial purchases from the U.S.

Figure 36 shows the increased importance of government-assisted U.S. export programs since the late 1970s and their increased role in total U.S. farm product exports. Prior to the late 1970s, these programs accounted for only a small fraction of all U.S. agricultural exports. Increased emphasis on government-assisted exports began just before the start of this decade, as developing nation debt problems began to emerge. The reduced U.S. farm product exports since 1980-81 provided an incentive to expand such funding, and current political pressures in the U.S. may result in increased funding for related programs in the next few years.

Figure 37 shows the composition of CCC Credit Guarantee and Blended Credit Export programs by major destinations and products in fiscal year 1983-84. Major destinations under the CCC Credit Guarantee programs were Latin America, the Middle East, South Korea, and Western Europe, in that order. Wheat, feed grains, oilseeds, and oilseed products were major commodities involved. Blended Credit programs were targeted heavily toward Africa and the Middle East, with wheat and wheat flour representing the major commodities exported under these programs.

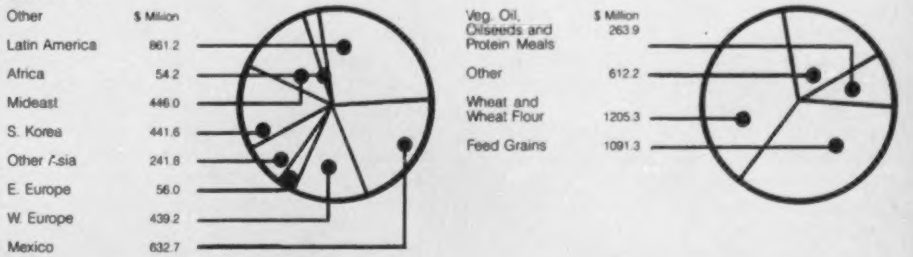
Figure 36. Dollar Value of U.S. Agricultural Exports under Government-assisted Programs and Other Sales, 1970-84 Fiscal Years.



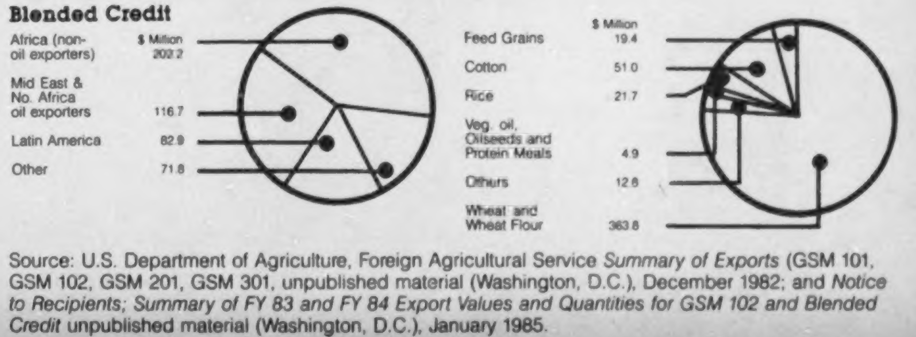
Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), January-February 1985 and various other issues; U.S. Department of Agriculture, Foreign Agricultural Service *Summary of Exports* (GSM 101, GSM 102, GSM 201, GSM 301, unpublished material (Washington, D.C.), December 1982; and *Notice To Recipients: Summary of FY 83 and FY 84 Export Values and Quantities for GSM 102 and Blended Credit* unpublished material (Washington, D.C.), January 1985.

Figure 37. Distribution of Commodity Credit Corporation Export Credit Guarantees and Blended Credit Export Programs by Destinations and Products, Fiscal Year 1983-84.

CCC Credit



Blended Credit



Source: U.S. Department of Agriculture, Foreign Agricultural Service *Summary of Exports* (GSM 101, GSM 102, GSM 201, GSM 301, unpublished material (Washington, D.C.), December 1982; and *Notice to Recipients; Summary of FY 83 and FY 84 Export Values and Quantities for GSM 102 and Blended Credit* unpublished material (Washington, D.C.), January 1985.

U.S. Agricultural Trade Trends by Commodity Groups

As shown in Figure 38 and Table 26, the total dollar value of U.S. agricultural exports rose modestly in the 1983-84 fiscal year after a two-year downtrend. Total agricultural exports were valued at $38 billion, 9 percent above the previous year, but remained modestly below the peak 1980-81 level. Gains occurred in 1983-84 mainly in the grains, cotton, livestock, and livestock products groups, with crop export values being increased primarily by adverse weather and the 1983 PIK Program, which sharply reduced production of major crops. Reduced production resulted in higher prices for major crops. The increases, however, still left grain export values well below the 1980-81 level.

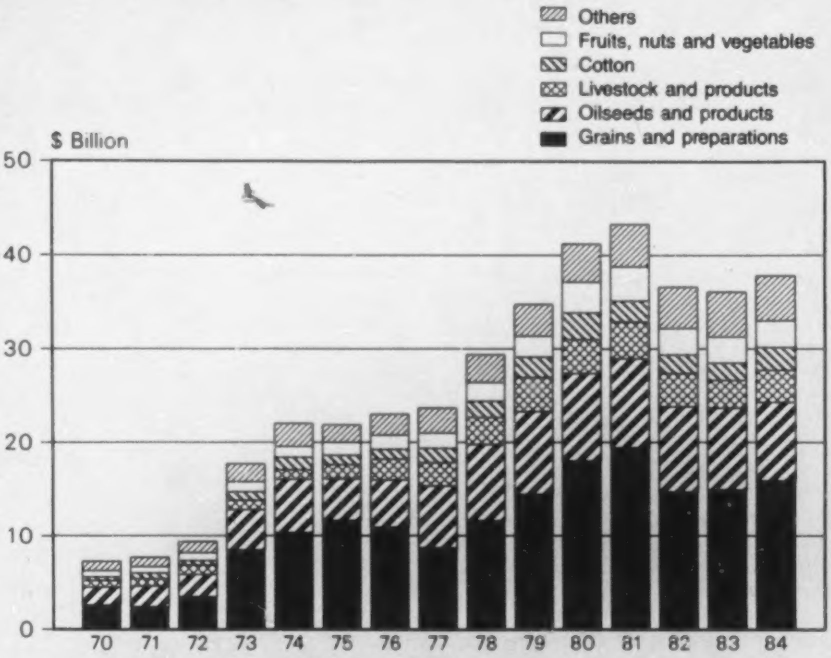
Composition of U.S. Agricultural Exports

Grain and oilseed exports, as indicated in Figure 38, accounted for a large part of the growth of agricultural exports from 1970 through 1981. These same products also accounted for much of the drop in value of exports since 1981. Livestock and poultry exports make up about one-tenth of all U.S. agricultural exports in dollar value. The value of these exports as a group in 1983-84 was approximately the same as three years earlier, while cotton and tobacco exports were up slightly. The value of fruit, nut, and vegetable exports dropped sharply in the past three years, with the 1983-84 value 21 percent lower than in 1980-81. Grain and grain product exports during the same period also declined by 21 percent. Grains, feeds, oilseeds, and oilseed products together have accounted for approximately two-thirds of U.S. agricultural exports in recent years.

U.S. Agricultural Imports

In previous issues of this report, it has been noted that sustained trading relationships require a two-way exchange between trading partners. If the United States is to export products and services to other countries, it must also be willing to import from those countries in order to maintain a lasting trading relationship. In other words, products Americans buy from other countries generate earnings that those countries can use to purchase U.S. exports. In this process, trading partners usually produce products for export in which they have a comparative advantage (can be produced more efficiently at home than other products

Figure 38. Value of U.S. Agricultural Exports by Commodity, 1970-84 Calendar Years.



Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), January-February 1985 and various other issues. Livestock excluding poultry and dairy products.

Table 26. Composition of U.S. Agricultural Exports by Type of Commodity, 1976-77, 1980-81, 1982-83, and 1983-84 in Billions of Dollars.[a]

	October-September Fiscal Years				Percentage of 1983-84
Commodity Group	1976-77	1980-81	1982-83	1983-84	Total Exports
Feed grains	5.39	10.40	6.50	8.13	21.4
Oilseeds	4.64	6.98	6.33	6.23	16.4
Oilseed meal	0.97	1.67	1.49	1.24	3.3
Vegetable oils	0.77	1.10	.90	1.13	3.0
Wheat and wheat products	3.05	8.05	6.21	6.77	17.8
Rice	0.69	1.54	.87	.90	2.4
Meat and meat products	0.61	0.99	.93	.93	2.4
Hides and skins	0.80	1.00	1.00	1.32	3.5
Dairy products	0.17	0.24	.35	.39	1.0
Poultry and poultry products	0.30	0.77	.39	.36	.9
Other animals and animal products	0.77	1.11	1.01	1.15	3.0
Cotton	1.54	2.23	1.68	2.39	6.3
Fruits, vegetables, and nuts	2.45	3.56	2.87	2.82	7.4
Tobacco	1.08	1.34	1.49	1.43	3.8
Others	0.78	1.63	2.75	2.84	7.5
Total	24.01	42.61	34.77	38.03	100.1

[a] Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), November-December 1984, November-December 1983, November-December 1982, and November 1977.

Table 27. Value of U.S. Agricultural Imports in 1975-76, 1980-81, and 1982-83 and 1983-84 October-September Fiscal Years by Commodity Groups in Billions of Dollars.[a]

Product	1975-76	1980-81	1982-83	1983-84	Percent Change 1975-76 to 1983-84
Complementary Imports					
Cocoa and chocolate	0.60	0.95	0.83	1.06	+77
Coffee	2.39	3.08	2.83	3.03	+27
Rubber	0.47	0.77	0.58	.85	+81
Tea	0.09	0.13	0.13	.19	+111
Bananas and plantains	0.26	0.53	0.59	.67	+158
Drugs	0.11	0.14	0.16	.20	+82
Others	0.28	0.32	0.35	.68	+143
Total complementary imports	4.21	5.92	5.47	6.68	+59
Supplementary Imports					
Dairy products	0.26	0.52	.61	.60	+131
Hides and skins	0.20	0.28	.13	.15	−25
Meat and meat products, excluding poultry	1.44	2.22	2.05	1.88	+31
Poultry and poultry products, excluding eggs	0.09	0.10	.08	.09	0
Other animal products and animals	0.33	0.61	0.64	.74	+124
Total animals and animal products	2.31	3.73	3.51	3.46	+50
Fruits, nuts, vegetables and products	0.88	2.32	2.32	2.94	+234
Sugar and products	1.35	2.42	1.13	1.35	0
Alcoholic beverages	0.43	1.13	1.32	1.51	+251
Oilseeds and products	0.54	0.91	.01	.02	−96
Grains, grain products, and feed	0.23	0.41	.11	.13	−43
Tobacco	0.28	0.37	.73	.56	+100
Others	0.30	0.01	1.67	2.25	+650
Total supplementary imports	6.31	11.30	10.80	12.22	+94
Total agricultural imports[b]	10.51	17.22	16.27	18.90	+80

Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade the United States* (Washington, D.C.), November-December 1984, and November-December 1983, November-December 1982, and November 1977.

[a,b] Totals may not add due to rounding.

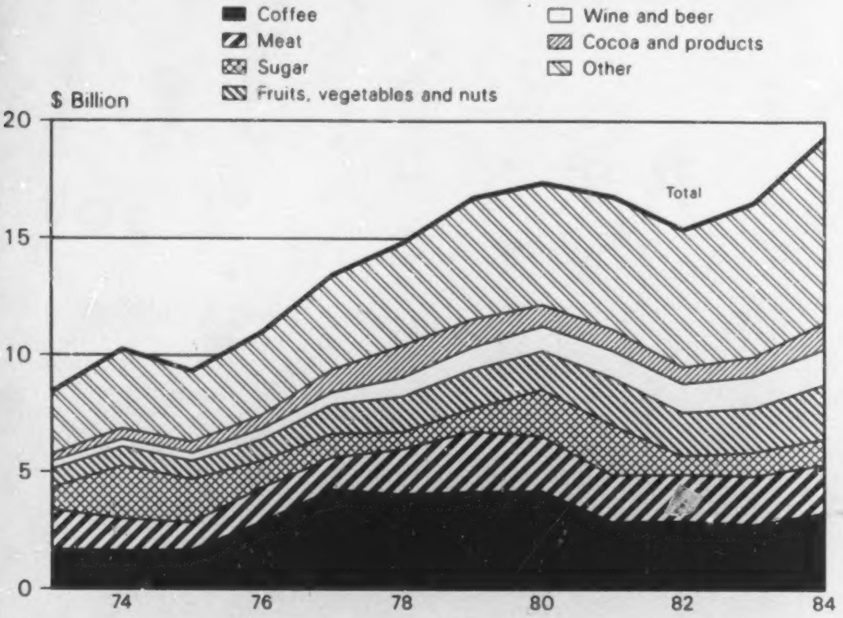
that might be imported). These same trading partners also tend to import products that can be produced more economically by their trading partners. Through this process, participants on both sides of the trading transaction can increase their standards of living over levels that would otherwise exist, and can carry on a substantial trading relationship over an extended period of time.[30] Because of this principle of comparative advantage, the U.S. imports a sizable volume of certain agricultural commodities.

Table 27 shows the composition of U.S. agricultural imports in 1983-84 and comparisons with recent years. Slightly over one-third of all U.S. agricultural imports is represented by products not produced commercially in the United States or produced only in very limited quantities because of climatic limitations. These products are classified as complementary imports because they do not compete directly with domestic production. Included in this category are coffee, tea, rubber, cocoa, drugs, bananas, and other tropical fruits. The largest single commodity in dollar value in this group, coffee, accounts for approximately one-half of all complementary imports. Total U.S. imports of complementary agricultural products in fiscal 1983-84 rose 22 percent above the previous year, in contrast to a 13 percent increase in imports of supplementary agricultural products.

Supplementary imports are those products that compete with domestic production. As shown in Table 27, the three largest supplementary import groups are: (1) fruits, nuts, vegetables, and associated products; (2) meat and meat products; and (3) alcoholic beverages. Despite a restrictive U.S. sugar import policy, U.S. sugar and sugar product imports are the fourth largest supplementary import group. Meat and meat product imports in 1983-84 accounted for about one-tenth of the dollar value of all U.S. agricultural imports. Alcoholic beverages and tobacco imports together accounted for approximately 11 percent of the total, along with 16 percent for fruits, nuts, vegetables, and preparations. While the United States is a large net exporter of oilseeds, oilseed products, grains, and feeds, it also imports small quantities of these products. With the exception of palm oil and coconut oil, these imports usually originate in Canada and represent marketings from elevators, processors, and farmers located near the U.S. border. In the same way, modest quantities of U.S. products sometimes flow across the U.S. border into Canada, although the strong U.S. dollar in the past two years has discouraged this and, instead, has encouraged increased U.S. imports of Canadian products. U.S. imports of palm oil originate largely in Malaysia, with the volume varying, depending on the price advantage relative to soybean oil. And U.S. coconut oil imports typically come from the Philippines.

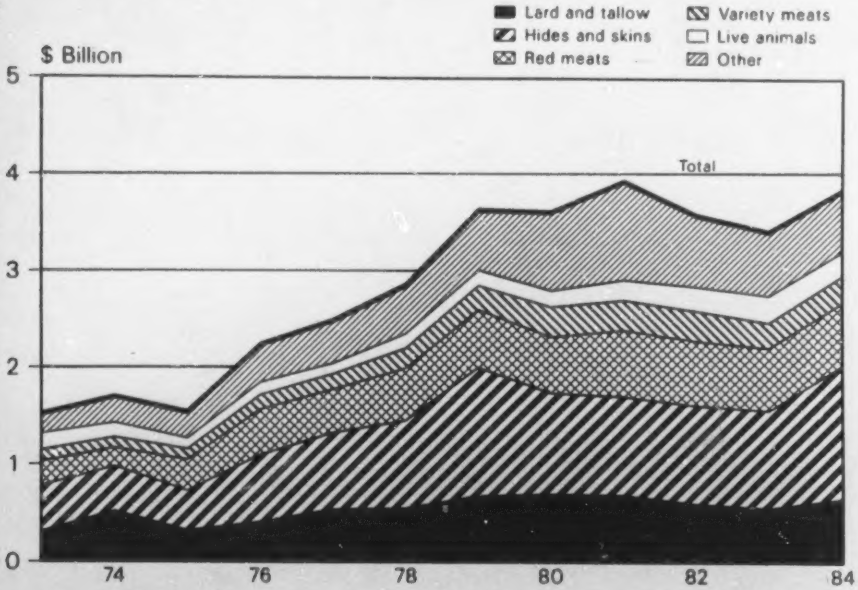
Figure 39 shows the trend in U.S. imports of agricultural products by major commodity groups since the early 1970s. Sugar imports have dropped considerably since the late 1970s because of declining prices, as well as technological developments in corn processing that have encouraged sharply increased use of high-fructose corn sweeteners in soft drinks and processed foods as an alternative to sugar. Trends in imports of meat and exports of livestock products are shown in Figures 40 and 41.

Figure 39. Value of U.S. Agricultural Imports by Commodity, 1972-84 Calendar Years.



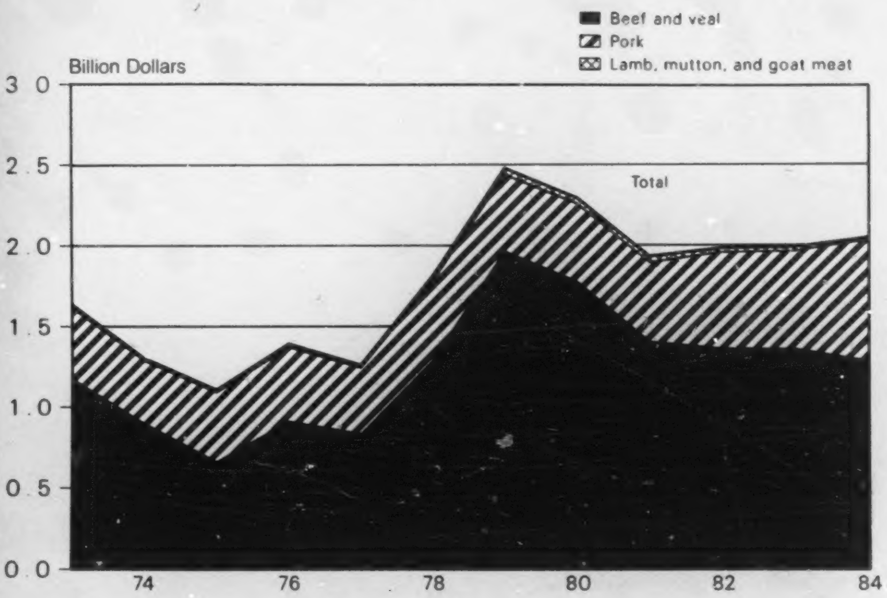
Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), January-February 1985 and various other issues. Note: fruits, vegetables, and nuts include bananas. Other includes dairy products, oilseeds and products, rubber, and other imports.

Figure 40. Value of U.S. Livestock Product Exports by Type of Product, 1973-84 Calendar Years.



Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), January-February 1985 and various other issues. Poultry exports are included in the "other" category.

Figure 41. Value of U.S. Red Meat Imports by Type of Product, 1973-84 Calendar Years.



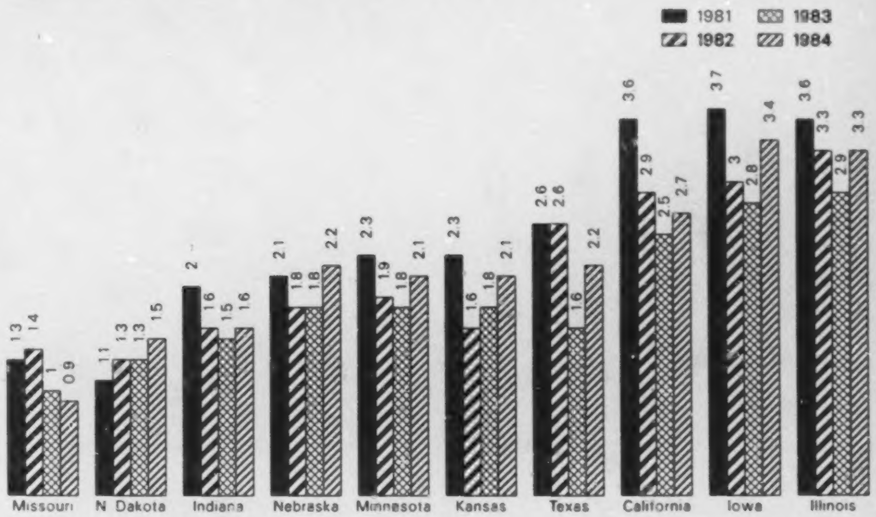
Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), January-February 1985 and various other issues.

U.S. Agricultural Exports by Leading States and Economic Groupings of Destinations

The value of U.S. farm product exports by 10 leading states for the past three fiscal years is shown in Figure 42. The top 4 exporting states are Iowa, Illinois, California, and Texas, in that order, with other top-ranking exporting states located in major grain-producing areas of the midwest. Illinois and Iowa are large exporters of coarse grains, soybeans, soybean products, and livestock. California and Texas reflect greater diversity in exports including fruits, vegetables, cotton, and nuts, as well as grain and livestock products. The relative ranking of the top 10 agricultural exporting states has changed little in the past 5 years, but occasionally shifts slightly from year to year depending on the size of crops in individual states. In 1984 Ohio replaced Missouri in tenth place, partly because of severe drought the previous year that adversely affected Missouri crop production.

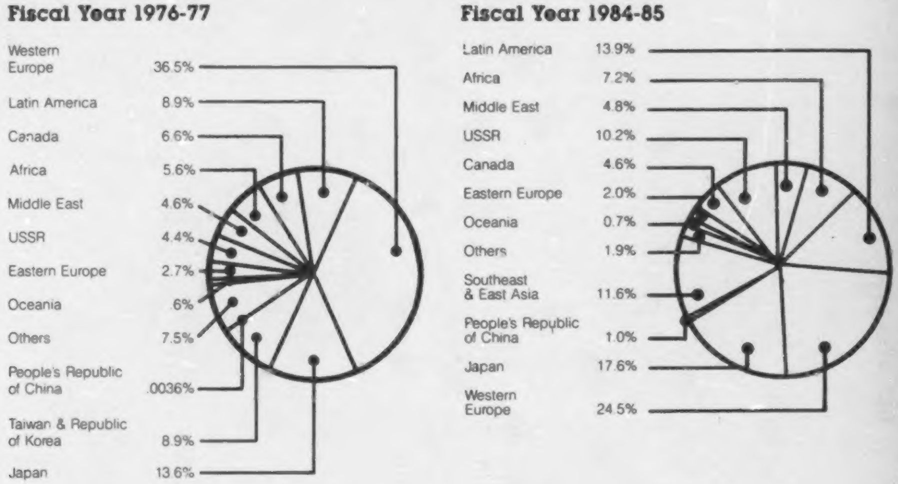
Figures 43 through 45 show total U.S. agricultural exports as well as corn and wheat exports by geographic destinations now and in the early 1970s. Western Europe has declined sharply in importance as a market for these products in recent years, while Japan and less developed countries have grown in importance as a market for U.S. corn. For combined exports of all U.S. farm products, major growth areas since the early 1970s include Latin America, Southeast and East Asia, and Japan, along with modest growth in exports to Africa. U.S. agricultural exports to Eastern Europe declined modestly from 1976-77 to 1984-85.

Figure 42. Value of U.S. Agricultural Exports by Selected States in Billions of Dollars, Fiscal Years 1980-81 through 1983-84.



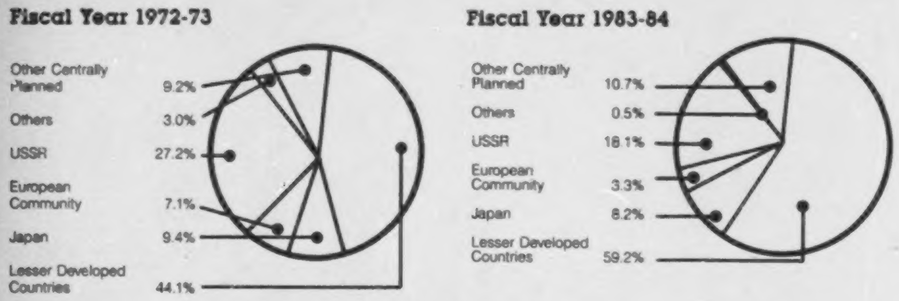
Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), March-April 1985 and various other issues and personal communications with officials of U.S. Department of Agriculture Ecónomic Research Service.

Figure 43. U.S. Agricultural Export Percentage Shares to Selected Destinations, 1976-77 and Projected 1984-85 Fiscal Years.



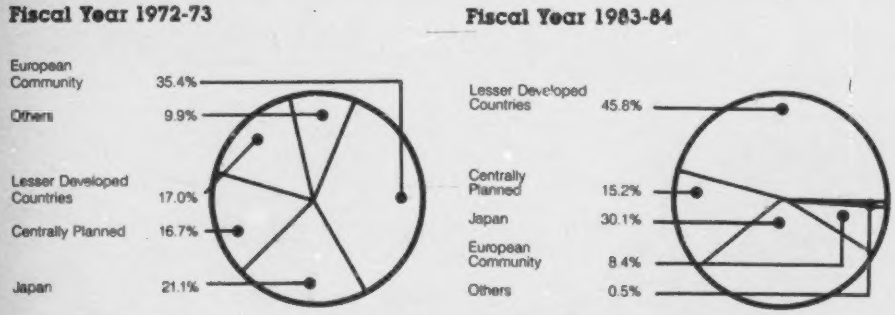
Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), March-April 1985 and various other issues.

Figure 44. U.S. Wheat Export Percentage Shares to Selected Destinations, October-September, 1972-73 and 1983-84.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains* (Washington, D.C.), FG 37-82, December 8, 1982 and Agricultural Marketing Service, *Grain and Feed Market News* (Independence, Mo.), various issues.

Figure 45. U.S. Corn Export Percentage Shares to Selected Destinations, October-September 1972-73 and 1983-84.



Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Grains* (Washington, D.C.), FG 37-82, December 1982 and Agricultural Marketing Service, *Grain and Feed Market News* (Independence, Mo.), various issues.

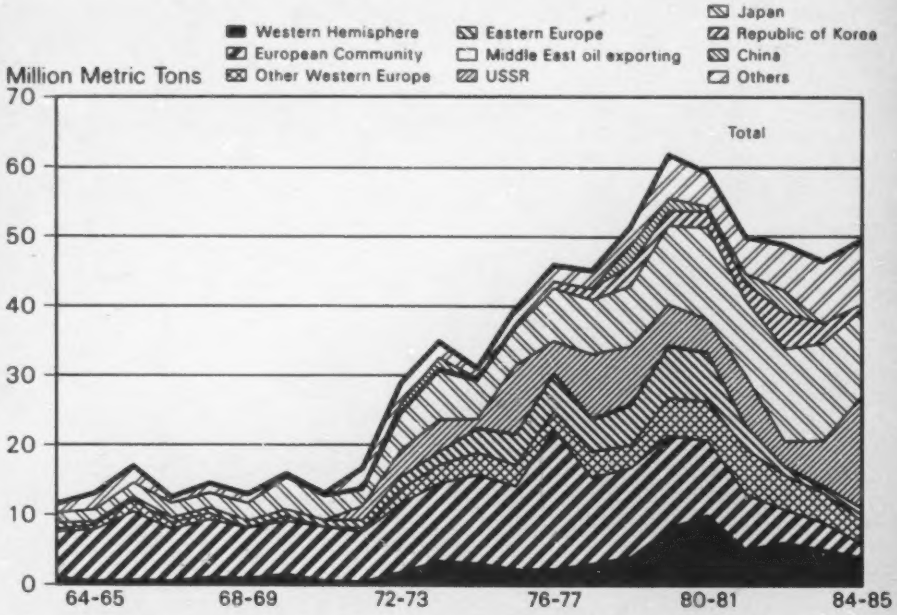
Trends in U.S. Corn and Coarse Grain Exports by Destination

Figures 46 and 47 reveal a dramatic change in the pattern of destinations for U.S. corn and coarse grain exports since the late 1970s. During most of the past two decades, the industrial economies of Western Europe and Japan represented the largest foreign outlets for these U.S. grains. Since 1979-80, however, the once large EC market for U.S. corn has dropped sharply in size along with a slight decline in exports to other West European nations. The once stable Japanese and Republic of Korea markets also have declined in size as other competitors have taken steps to export to these nations. China, after being a market outlet for U.S. corn from 1975-76 through 1982-83, dropped its purchases of U.S. corn to zero in the past two years and in fact has become a corn exporter. Chinese exports were an important factor behind declining U.S. corn and coarse grain exports to the Republic of Korea and Japan.

Partially but not completely offsetting these trends, Latin America has increased in importance as a market destination for U.S. corn along with Middle East oil exporting nations. The most dramatic change in U.S. corn and coarse grain exports, however, was the extremely sharp increase in USSR purchases in 1984-85 with imports of American corn by that nation far surpassing any previous year. Preliminary data indicate the Soviet Union will account for about one-third of all U.S. corn exports in the 1984-85 marketing year ending September 30, 1985. As noted in an earlier section, the sudden upsurge in Soviet purchases of U.S. corn reflected that nation's serious 1984 crop problems due to widespread drought, along with record livestock inventories early in the season.

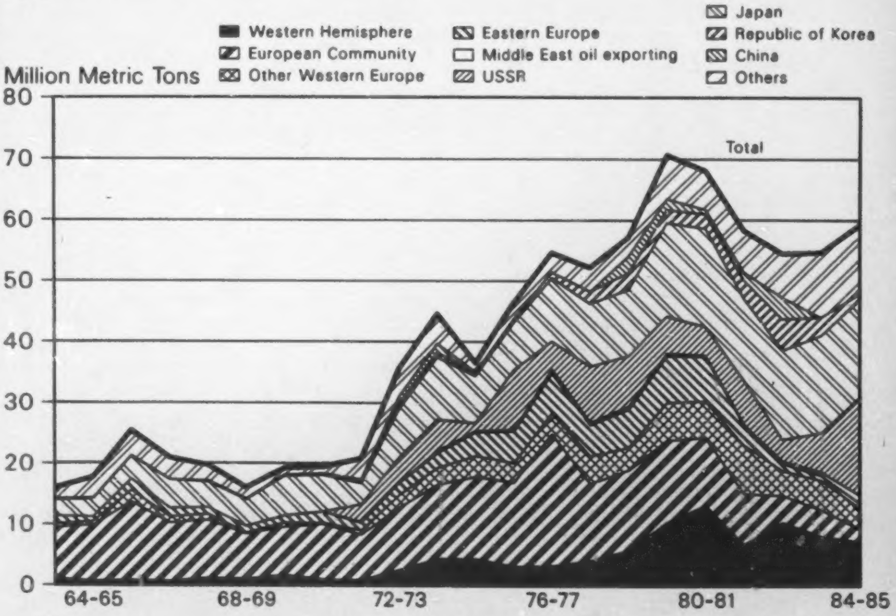
Early and highly tentative indications point to slightly lower U.S. corn and coarse grain exports in 1985-86 although the exact level of shipments will be influenced by the success of the U.S. Export Payment-In-Kind Program and the size of the 1985 USSR grain and forage harvests. Several developments, including changing U.S. farm programs and stability or modest weakness in the American dollar, appear to be setting the stage for at least slight growth in U.S. corn and coarse grain exports in the late 1980s and early 1990s. However, global debt problems, strong foreign competition, and slower economic growth appear likely to hold export growth rates during that period well below those of the 1970s.

Figure 46. U.S. Corn Exports by Destination, October-September 1963-64 to 1984-85.



Note: 1984-85 exports are projected using the October 1984-March 1985 percentage change from a year earlier.
Source: U.S. Department of Agriculture, Agricultural Marketing Service, *Grain and Feed Market News* (Independence, Mo.), various issues, and *Grain Market News* (Independence, Mo.), various issues.

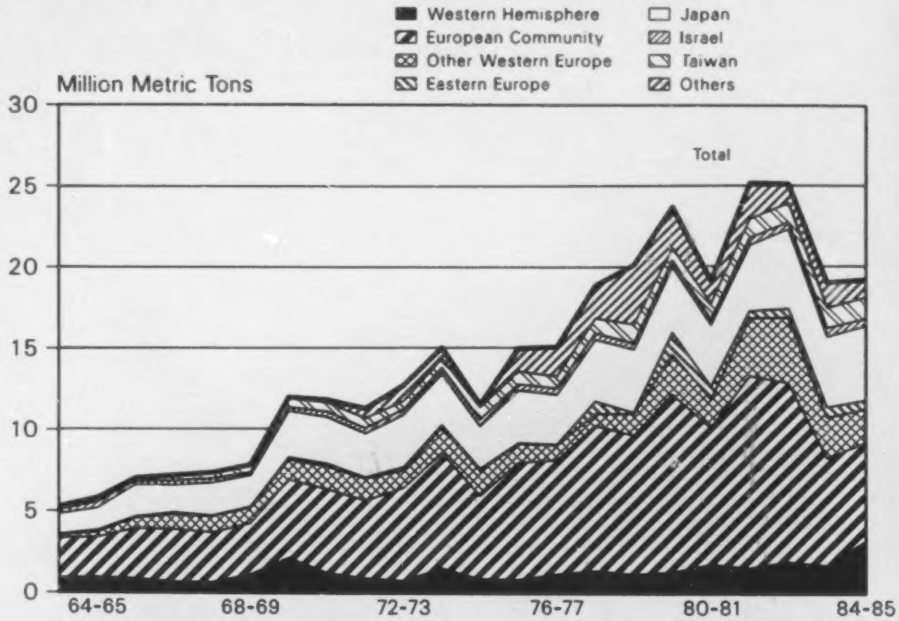
Figure 47. U.S. Coarse Grain Exports by Destination, October-September 1963-64 to 1984-85.



Note: 1984-85 exports are projected using the October 1984-March 1985 percentage change from a year earlier.
Source: U.S. Department of Agriculture, Agricultural Marketing Service, *Grain and Feed Market News* (Independence, Mo.), various issues, and *Grain Market News* (Independence, Mo.), various issues.

Trends in U.S. Soybean and Soybean Product Exports by Destination

Figure 48. U.S. Soybean Exports by Destination, October-September, 1963-64 to 1984-85.



Note: 1984-85 exports are projected using the October 1984-March 1985 percentage change from a year earlier.
Source: U.S. Department of Agriculture, Agricultural Marketing Service, *Grain and Feed Market News* (Independence, Mo.), various issues, and *Grain Market News* (Independence, Mo.), various issues.

For more than two decades, the industrial economies of Western Europe and Japan have been the major foreign outlets for U.S. soybeans and soybean meal, with soybean meal being an important input for livestock and poultry production (see Figures 48 and 49). U.S. soybean oil exports, on the other hand, are shipped primarily to developing nations where they are used for direct human consumption as cooking oils (see Figure 50). Until 1982-83, U.S. soybean and soybean meal exports exhibited a strong upward trend driven by growing consumer demand for livestock and poultry products and limited growth of competing protein meals.

Growth in foreign demand for U.S. soybeans and meal during the past two decades was greatest in the European Community, which recently has accounted for approximately two-thirds of all U.S. soybean meal exports and approximately half its soybean exports. Growth in this market during the 1970s was encouraged by rising consumer incomes, high domestic EC support prices for grain, a weak U.S. dollar, and an absence of EC import restrictions on soybeans and soybean meal. The EC's Common Agricultural Policy (CAP) maintained internal grain prices well above world levels, and a complex price support mechanism automatically adjusted for changes in the exchange rate of the U.S. dollar as it affected grain import costs. In contrast, soybean and meal imports entered EC at world price levels, with the weak U.S. dollar further enhancing soybean meal's attractiveness as a feed ingredient. The combination of support prices for coarse grains sharply above world levels and soybean meal priced at world levels created a soybean meal/corn price ratio in the EC much more favorable for soybean meal feeding than in the U.S. or most other nations. As a result, soybean meal in the EC was fed both as a protein source and as an energy source or grain substitute. In 1983-84, with a sudden, dramatic rise in soybean and soybean meal prices caused by the U.S. drought, the PIK Program and the strong U.S. dollar, EC computerized feed manufacturing operations reduced the amount of soybean meal being used as a grain substitute. Declining U.S. soybean meal exports to EC continued into 1984-85, with exports for the first half of the fiscal year running at slightly less than one-half the year earlier level and less than one-fourth as large as in the late 1970s. U.S. soybean exports to EC followed a similar trend but declined less drastically.

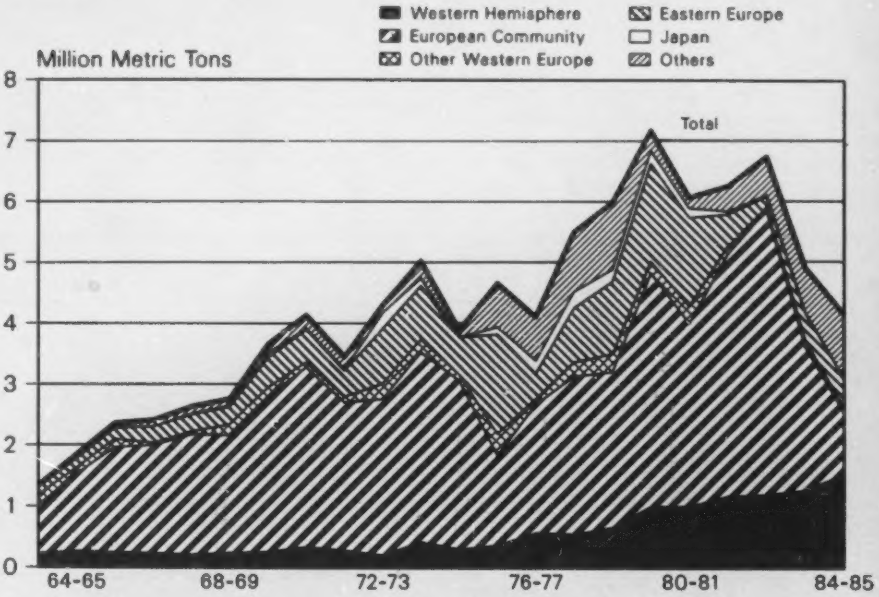
Other contributing factors behind the sharply lower EC purchases of U.S. soybeans and meal included: (1) a sluggish general economy with slower growth in EC incomes than in the 1970s and high unemployment; (2) a dairy surplus reduction program that sharply reduced manufacturing dairy feed sales in 1984-85;[31] (3) sharply expanded EC wheat feeding; and (4) large imports of U.S. corn gluten feed and meal as a substitute for soybean meal. Wheat has a higher protein content than corn, which it has replaced in livestock and poultry rations, thus reducing soybean meal requirements. Corn gluten feed and meal are byproducts of the rapidly growing U.S. corn sweeteners and alcohol fuels industry, with around 3.5 million metric tons of these products being exported to EC in the last two years.[32] U.S. soybean meal exports to EC in 1983-84 totaled 2.4 million metric tons, down from about 3.9 million tons in 1979-80.

The continued decline in U.S. soybean meal exports to EC was partially offset by increased exports to Western Hemisphere nations. However, with sharply lower shipments to EC, preliminary indications suggest total 1984-85 U.S. soybean meal exports may be 10 to 15 percent below a year earlier. Preliminary data indicate 1984-85 U.S. exports of unprocessed soybeans may be about one-tenth less than a year earlier, with reduced shipments to EC being partially offset by increased exports to the Western Hemisphere, Japan, and Taiwan.

Figures 48 and 49 indicate U.S. soybean and soybean meal exports briefly experienced a sharp decline in the mid-1970s. The decline at that time was triggered by a weather-reduced U.S. soybean crop in 1974, as well as a temporary world business recession. Reduced U.S. supplies generated sharply higher prices, which brought a rationing of usage in the EC as soybean meal prices increased sharply in relation to coarse grains. Utilization was much less affected in other countries where the coarse grain/soybean meal price ratio was not artificially influenced by government policies. After soybean and meal prices declined to more normal levels, U.S. exports to EC fully recovered within a three-year time period.

U.S. soybean and soybean meal exports in the years immediately ahead will depend on the exchange rate of the U.S. dollar, as well as EC livestock and dairy policies and world economic growth. The strengthening dollar in the early 1980s created a price shock in EC meal markets similar to that from a short U.S. soybean crop. With a moderate weakening of the U.S. dollar in the next few years, some growth in the U.S. bean and meal exports to EC would be likely along with potential growth in exports to Eastern Europe and USSR. However, growth rates would likely remain well below those of the 1970s because of slower growth in the world economy, continued debt problems in developing nations, and increased EC wheat feeding stemming from technological improvements in production of that grain.

Figure 49. U.S. Soybean Meal Exports by Destination, October-September, 1963-64 to 1984-85.



Note: 1984-85 exports are projected using the October 1984-March 1985 percentage change from a year earlier.
Source: U.S. Department of Agriculture, Agricultural Marketing Service, *Grain and Feed Market News* (Independence, Mo.), various issues, and *Grain Market News* (Independence, Mo.), various issues.

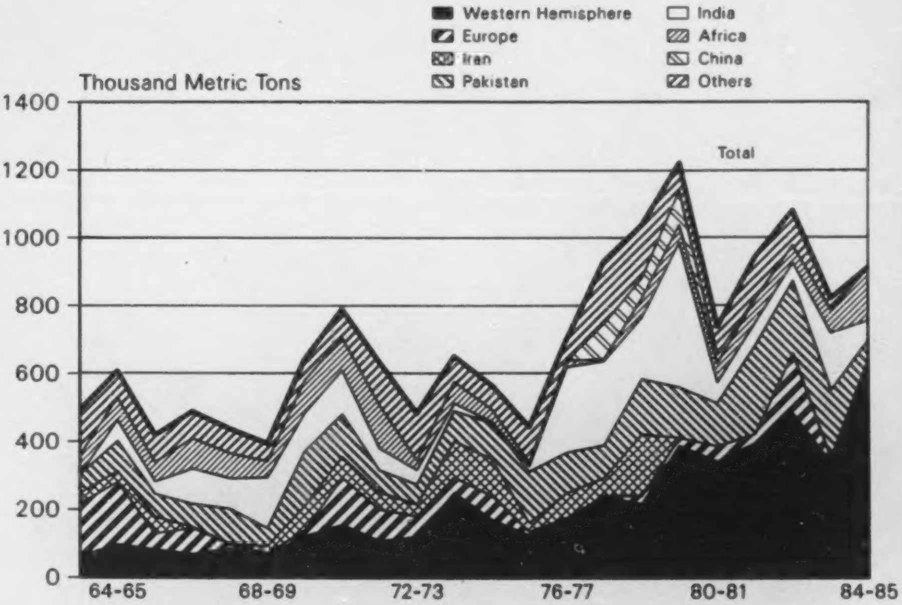
In contrast to U.S. soybean meal and soybean exports, major foreign markets for soybean oil consist primarily of developing nations in Asia, Africa, and Latin America. As Figure 50 indicates, U.S. soybean oil exports have been highly variable from year to year for more than two decades. Short-term fluctuations in exports are due largely to changes in production of major competing vegetable oils, animal fats, marine oils, and changes in U.S. soybean oil supplies and prices. The export demand for U.S. soybean oil is highly price inelastic; in other words, large changes in prices are needed to bring significant increases or decreases in exports, provided all other market influences remain unchanged. For example, U.S. soybean oil exports dropped sharply in 1983-84, not because of reduced demand, but primarily due to drought-reduced U.S. soybean supplies, limited availability of U.S. soybean oil for export, a sharp rise in soybean oil prices, and the rationing effect on exports resulting from the higher prices. To bring about the required sharp decline in U.S. exports, soybean oil prices in late 1983 and early 1984 rose more than 50 percent above the average level of recent years. The strong dollar and debt burdens of developing nations were other factors tending to reduce 1983-84 soybean oil exports. However, with a high percentage of U.S. soybean oil exports being shipped under government financing programs, these factors appear to have been less significant than in grain and soybean exports.

Exports of U.S. soybean oil in the first half of the 1984-85 fiscal year rose sharply above the previous season, but at an annual rate remained modestly below peak levels of the late 1970s. Increased soybean oil exports during this period were shipped largely to Latin American nations and Africa. Exports to India and Pakistan dropped sharply below a year earlier as a result of increased competition from domestic oilseeds in these countries and Malaysian palm oil. The long-term upward trend in Malaysian palm oil production was temporarily interrupted in late 1983 and the first few months of 1984 as a result of dry weather and stress on trees from the introduction of a weevil to aid in pollination. However, palm oil production resumed its long-term upward trend by mid-1984.

World fat and oil supplies also were tightened in 1983-84 by an unusually small 1983 U.S. cottonseed crop (down 35 percent from 1982 and down 51 percent from 1981), a resulting decline in U.S. cottonseed oil supplies, and by cyclically reduced olive oil production in Mediterranean countries.[33] These developments brought a sizable decline in visible and invisible (unreported) world fat and oil inventories by late 1984. With inventories at minimal levels, global soybean oil trade patterns in the 1984-85 trade year reflected efforts by the world vegetable oil trade to replenish stocks to a more normal level. Stocks-rebuilding efforts helped to maintain 1984-85 soybean oil prices well above levels of the late 1970s and early 1980s despite increased U.S. and global oilseed and vegetable oil production. Early indications are that stocks rebuilding will continue into at least the early months of the 1985-86 trade year and will help maintain relatively strong U.S. soybean oil exports during this period despite increased competition from several foreign products.

In examining prospects for U.S. soybean oil exports in the late 1980s and early 1990s, Figure 50 shows a modest long-term upward trend in exports despite large year-to-year fluctuations. The upward trend reflects an annual population growth of over 2 percent in most developing nations. In addition, per capita fat and oil consumption in these countries is moderately sensitive to changes in per capita incomes. The long-term upward trend of population and incomes in developing countries appears likely to push U.S. soybean oil exports irregularly higher in the years ahead. In contrast, per capita fat and oil consumption in industrialized nations already is large and is expected to increase only slowly. Thus, developing countries are likely to remain the leading export markets for U.S. soybean oil in the years ahead. Since soybean oil competes with a wide range of other fats and oils, large year-to-year fluctuations in U.S. soybean oil exports also are likely to continue in the foreseeable future, due to fluctuations in availability of competing products.

Figure 50. U.S. Soybean Oil Exports by Destination, October-September, 1963-64 to 1984-85.



Note: 1984-85 exports are projected using the October 1984-March 1985 percentage change from a year earlier.
Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, Oilseed and Products* (Washington, D.C.), various issues.

Major products that compete with soybean oil include butter, lard, tallow, sunflowerseed oil, cottonseed oil, rapeseed oil, peanut (groundnut) oil, palm oil, coconut oil, safflower oil, olive oil, and fish oil. In contrast to most of the oilseeds from which many of the competing vegetable oils are produced, soybeans have a relatively low oil content (18 percent) and a relatively high protein meal yield per ton (80 percent). Long-term global demand for soybean meal has grown more rapidly than the demand for soybean oil, partly because of strong dietary shifts toward more meat and poultry consumption as incomes rise in rapidly and moderately developing economies. This has generated long-term growth in demand for livestock and poultry feed ingredients, and relatively slower growth in global demand for fats and oils combined with strong competition from other oilseeds that have a much higher oil content than soybeans. In the years ahead, indications are that competition from expanded palm oil production and exports will increase significantly and will continue to restrain long-term growth of U.S. soybean oil exports. Tree plantings in major producing regions of Malaysia have been expanded sharply in recent years and may continue to expand through the remainder of this decade. In addition, improved management practices have the potential to increase palm oil production per hectare significantly in the years ahead.[34]

These forces, from the viewpoint of the U.S. soybean industry, suggest a need for continued priority on market development as well as development of new products from soybean oil. The unusually tight U.S. and world soybean oil supplies of 1983-84 and 1984-85 appear to be a temporary development, although at least one to two additional years may be needed to rebuild global supplies to pre-1983-84 levels.

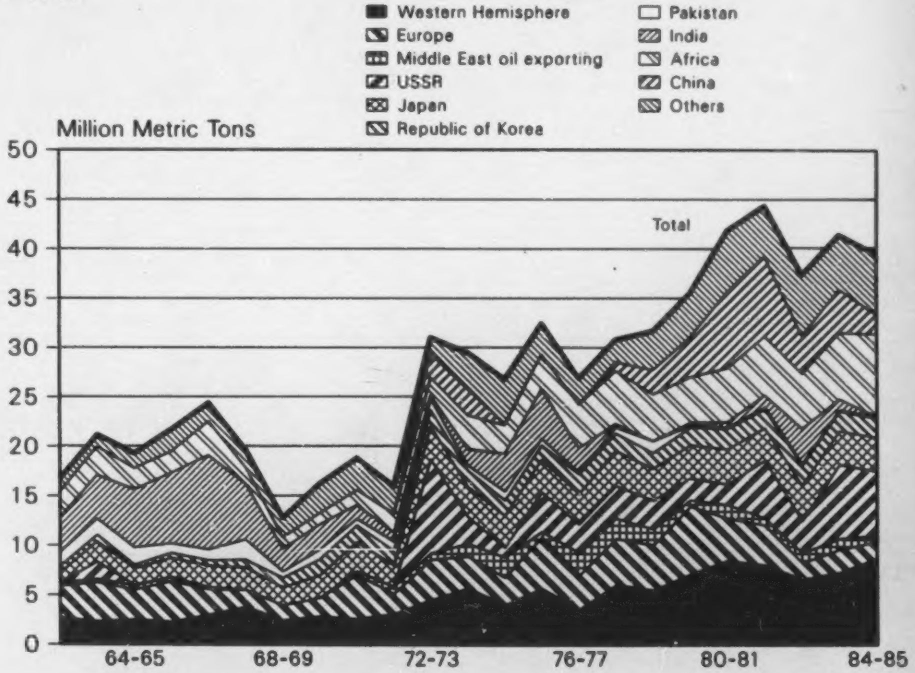
U.S. Wheat Exports by Destination

Figure 51 reveals substantial changes in destinations of U.S. wheat exports since the late 1970s, with the changes becoming even more dramatic in the 1984-85 fiscal year. The two most pronounced changes were an abrupt decline in Chinese purchases of U.S. wheat and the rapid growth of Africa as a market for U.S. wheat. In addition, Europe and the Middle East oil exporting nations have reduced their imports of U.S. wheat significantly in recent years. Reduced European imports reflect substantially increased wheat production in that area. While Europe is a net exporter of wheat, much of its crop consists of soft wheat varieties. Hard wheat and durum wheat continue to be exported to Europe by the U.S. to meet its deficit domestic supplies of these wheats. Reduced sales to the Middle East in part reflect increased competition for that market by other wheat exporting nations.

In addition to these trends, U.S. wheat exports to Latin American nations have continued their long-run upward trend, with the Western Hemisphere and Africa together accounting for slightly less than half of all U.S. wheat exports in the 1984-85 fiscal year. Exports to India dropped almost to zero in 1984-85 as a result of that nation's large domestic production, rising carryover stocks and its internal pressure to export wheat.

After a temporary upturn in U.S. wheat exports in fiscal 1983-84, exports in the current fiscal year ending September 30, 1985, are expected to decline to about one-tenth less than the record 1980-81 level. Export trends in the next few years will depend somewhat on the success of the U.S. Export Payment-In-Kind (Export PIK) Program announced in mid-1985 as well as continued global population growth and expected modest world economic growth. The Export PIK Program is intended to meet subsidized competition from other wheat exporters. Depending on responses of other exporters, it may set the stage for at least slight growth trend in U.S. wheat exports in the late 1980s and early 1990s. However, technological developments in wheat production in India, China, and the European Community appear to be nonreversible and will likely generate strong competition in world wheat export markets in the next few years.

Figure 51. U.S. Wheat Exports by Destination, October-September, 1962-63 to 1984-85.



Note: 1984-85 exports are projected using the October 1984-March 1985 percentage change from a year earlier.

Source: U.S. Department of Agriculture, Agricultural Marketing Service, *Grain and Feed Market News* (Independence, Mo.), various issues, and *Grain Market News* (Independence, Mo.), various issues.

Figure 51 also reveals large year-to-year variations in U.S. wheat exports during the past two decades. This variability is likely to continue in future years and will contribute to significant year-to-year changes in U.S. and world wheat prices. Variability of U.S. exports is related partly to fluctuating production in four important areas—India, China, USSR, and Australia. The first three are populous nations with a history of substantial variations in rainfall and temperatures from one year to the next. Their import requirements are inversely related to the size of domestic production.

Australia has a highly variable climate, is relatively thinly populated, and is a major exporter of wheat. When its weather is favorable for wheat production, the U.S. tends to face increased competition in world wheat markets. In contrast to the U.S., Australia and other wheat exporting nations have not developed a policy of accumulating reserve stocks when population is large.[35] As a result, marketing policies of other exporting nations often leave the U.S. as a residual supplier to world markets. When world supplies are large and world prices are low, the U.S. traditionally has tended to accumulate reserve stocks to support prices. Conversely, when world grain supplies are reduced, U.S. policies have encouraged these reserve stocks to be utilized to fill the gap in supplies resulting from reduced foreign crops. At this writing (mid-1985), the entire U.S. agricultural price support system, including grain storage and reserve programs, is being critically examined by the Congress and the U.S. administration.[36] Depending on 1985 legislative developments, the U.S. role as a residual supplier and holder of reserve stocks could change substantially in the years ahead.

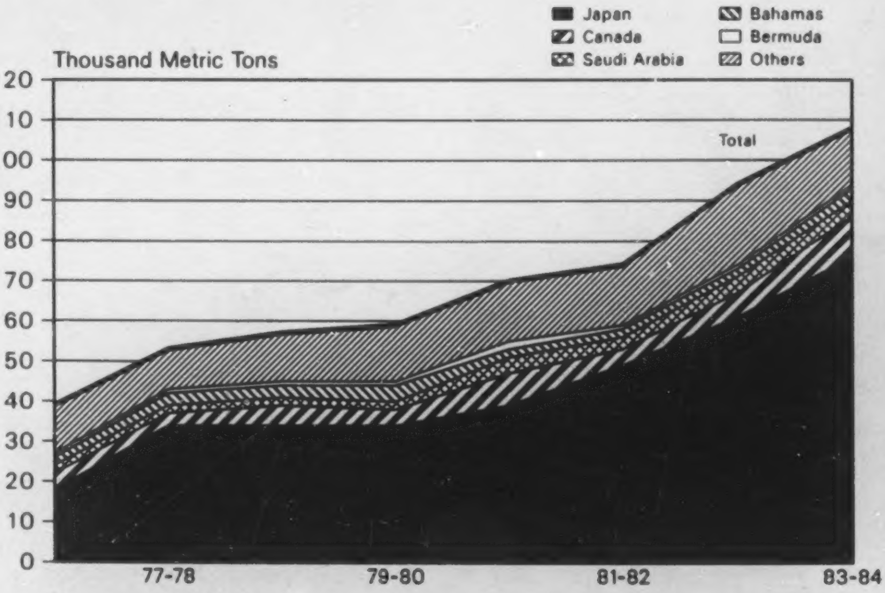
Trends in U.S. Red Meat and Poultry Exports by Destination

Major export markets for U.S. beef are Japan and Canada (see Figure 52). Japan now accounts for nearly three-fourths of all U.S. beef exports, with an additional 10 percent being exported to Canada in 1983-84. The Japanese market for U.S. beef has grown substantially since the mid-1970s, partly in response to pressures from the U.S. government to ease its import restrictions. On a tonnage basis, total U.S. beef exports are now about two and one-half times as large as in 1976-77, with much of the growth due to the increased Japanese purchases.

Future growth in U.S. beef exports will depend strongly on trade negotiations to ease import barriers in Japan as well as other nations. While a modest easing of such restrictions is possible, major changes in foreign nations' beef importing policies should not be expected in the near future. Foreign beef producers are extremely sensitive to changes in import policies that would increase supplies and depress prices for their products. And in Japan as well as several other beef importing nations, agricultural producers have substantial political influence. Resistance of foreign producers to easing of trade barriers will likely continue as a restraining influence on U.S. beef exports in the years ahead.

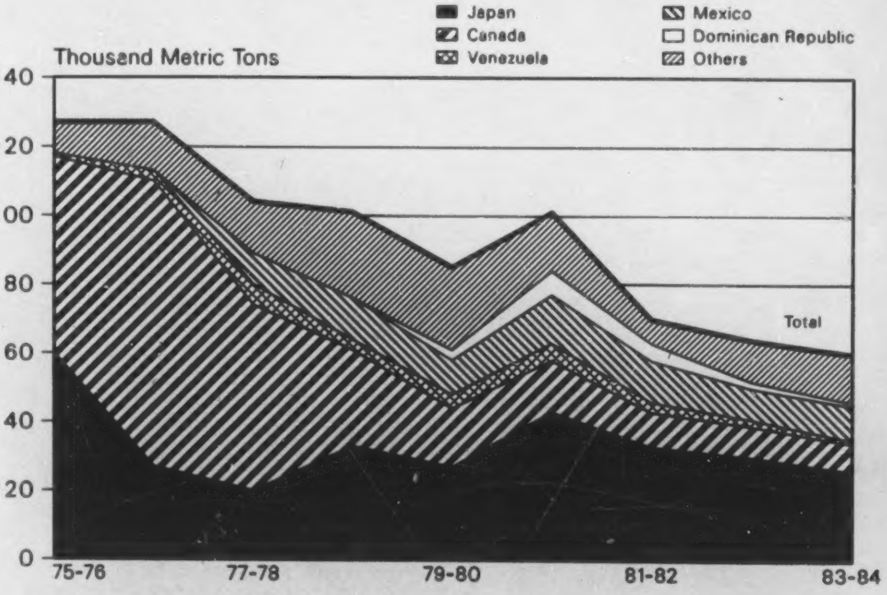
Major destinations for U.S. pork exports include Japan, Mexico, and Canada, as shown in Figure 53. Pork exports from the U.S. to Canada have been a major downtrend from the late 1970s through 1982-84, partly as a result of the strong U.S. dollar, which discourages U.S. exports. With declining exports to both Japan and Canada, U.S. pork exports, on a tonnage basis in 1983-84, were only about half as large as in 1975-76. Declining U.S. pork exports also reflect the slow growth of the world economy and strong competition from pork exporting nations in Western and Eastern Europe. With declining exports since the mid-1970s, future U.S. pork export prospects are uncertain. However, a weaker U.S. dollar and slightly accelerated world economic growth would help to stabilize or slightly increase export demand for U.S. pork.

Figure 52. U.S. Beef and Veal Exports by Major Destinations, 1976-77 through 1983-84, October-September Fiscal Years.



Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agriculture Trade of the United States* (Washington, D.C.), November-December 1984 and various other issues.

Figure 53. U.S. Pork Exports by Major Destinations, 1975-76 through 1983-84, October-September Fiscal Years.

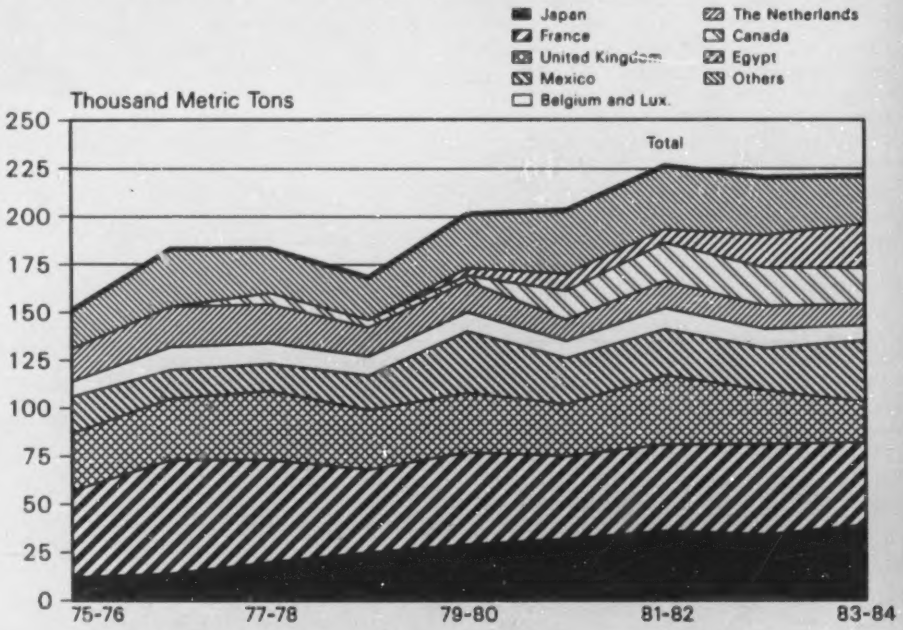


Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agriculture Trade of the United States* (Washington, D.C.), November-December 1984 and various other issues.

In contrast to beef and pork exports, edible offals and variety meats have shown a slight upward trend since the mid-1970s (see Figure 54). Major destinations for exports of these products include Western European nations, Japan, Mexico, and Canada. In the last seven years, Egypt also has emerged as a signficiant growth market for U.S. edible offals and variety meats. By 1983-84, it accounted for one-tenth of all U.S. exports of these products and ranked fourth in size of purchases, behind France, Mexico, and Japan.

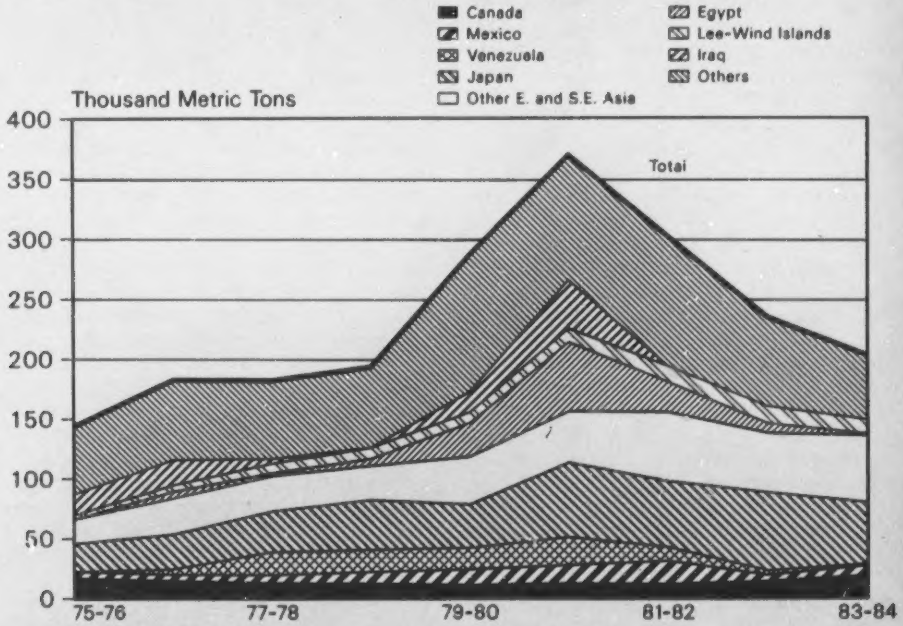
U.S. poultry meat exports also have been in a sharp downward trend in the last few years, as shown in Figure 55. Exports of these products in fiscal 1983-84 were about one-tenth less than a year earlier and about 40 percent less than in 1980-81. Declining poultry meat exports reflect subsidized competition from EC and Brazil, as well as adverse effects from the strong U.S. dollar and sluggish world economic growth. Much of the decline has been accounted for by reduced exports to Iraq, Egypt, Mexico, Venezuela, and several countries in the "Other" category in Figure 55. Growth in U.S. poultry meat exports to Canada, and other southeast and eastern Asian markets, including Japan, offset a small part of the decline in exports to other areas during the 1980-81 to 1983-84 period. The future of U.S. poultry meat exports will depend heavily on the exchange rate of the U.S. dollar and the strength and timing of changes in world economic growth.

Figure 54. U.S. Exports of Edible Offals and Variety Meats by Major Destinations, 1975-76 through 1983-84, October-September Fiscal Years.



Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agriculture Trade of the United States* (Washington, D.C.), November-December 1984 and various other issues.

Figure 55. U.S. Fresh and Frozen Chicken and Turkey Exports by Major Destinations, 1975-76 through 1983-84, October-September Fiscal Years.



Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agriculture Trade of the United States* (Washington, D.C.), November-December 1984 and various other issues.

Trade Policy Issues in the Late 1980s

The financial condition of U.S. agriculture and related economic sectors has deteriorated substantially in the past three years, due in part to the sharp decline in the nation's agricultural exports and various factors behind the declining export demand. Financial stress in American agriculture and agribusiness is shown by the unusually high percentage of U.S. farmers being forced to exit from agriculture through bankruptcy or other means, excess capacity in the U.S. agricultural marketing and transportation system of as much as 35 to 50 percent, severe financial losses and consolidation of operations in the U.S. farm machinery industry, failure of the largest number of U.S. agricultural banks since the 1930s, and a sharp decline in asset values in U.S. agriculture and agribusiness.

To a degree, these problems are not unique to U.S. agriculture, but also are being faced by farmers in other nations. However, such problems appear to be much more serious in the U.S. than elsewhere, for at least three reasons. First is the traditional role of the U.S. as the adjustment mechanism for balancing world supply and demand. Most other exporting nations do not have a policy of building large carryover stocks when world supplies exceed demand. Instead, their agricultural sectors are structured to move excess production into world markets and maintain carryover stocks near normal levels. Long-standing U.S. policies result in much of the world's excess grain production being held in U.S. carryover stocks. Thus, when foreign grain supplies are large relative to demand, U.S. exports tend to decline as other nations market their excess production. The U.S. thus becomes a residual supplier and its carryover stocks rise. Second, this process has been accelerated since 1980 by the strength of the American dollar, which has placed U.S. farm product exports at a competitive disadvantage relative to other exporters. In fact, strength of the U.S. dollar has been great enough to permit imports of major farm products such as wheat, soybeans, soybean oil, oats, and pork into the U.S. at times during the past year, despite sizable import duties. A strong U.S. dollar encourages foreign nations to expand agricultural production and also enables them to market those supplies more easily than would be possible with a weak dollar.

A third factor making U.S. agriculture extremely vulnerable to declining export demand is its large excess production capacity. In the absense of government supply control programs, domestic demand would absorb only about two-fifths of the normal U.S. wheat production, along with one-half of the U.S. soybean crop and two-thirds of the annual U.S. corn production. A healthy and growing export demand thus is vitally important to U.S. agriculture in utilizing its excess production capacity. Other sectors with an important stake in strong export markets include rural communities across the U.S. and workers and firms in the agricultural input, marketing, finance, and transportation sectors.

Trade policies alone will not solve the financial problems of U.S. agriculture. But because of its heavy dependence on exports, realistic domestic policies for U.S. agriculture cannot be formulated without a recognition of their linkages to the export sector and the current export environment. With severe financial stress in U.S. agriculture and a progression of events toward an international trade war, there is an increasing urgency for U.S. and its trading partners to carefully examine policies needed to encourage agricultural exports.

Dealing with Exchange-rate Problems

To illustrate the depressing effect of the strong U.S. dollar on the nation's farm product exports, a U.S. Department of Agriculture analysis indicates $3 billion of the decline in U.S. farm product exports during 1981-82 can be attributed to strength of the dollar relative to foreign currencies. Almost 10 million tons (400 million bushels) of the decline were assigned to corn exports alone. The authors also indicate a 20 percent inflation-adjusted rise in the dollar over a two-year period will decrease combined U.S. exports of corn, wheat, and soybeans by 16 percent from levels that would otherwise exist, provided other market influences remain unchanged.[37]

With this sensitivity of exports to exchange rates, it appears important to give high priority to policy changes dealing with the underlying causes of the strong dollar. The strong U.S. dollar, to a large extent, appears to have its roots in U.S. monetary and fiscal policy, including the large U.S. budget deficit and its resulting decrease in funds available for private borrowing and investment. The deficit is being financed in part by an inflow of foreign capital to earn high U.S. real (inflation-adjusted) interest rates. Increased movement of investment funds into the U.S. and reduced U.S. foreign investments tend to strengthen the demand for the U.S. dollar relative to the available supply, thus increasing its value in foreign exchange markets. This process also tends to drain investment funds from other nations, thus tending to reduce foreign economic growth rates and retarding growth of export demand in some traditionally large U.S. agricultural export markets such as Western Europe. High U.S. real interest rates stem from a restrictive U.S. monetary policy that has been used to offset inflationary pressures from deficit spending. More liberal growth of the nation's money supply to finance the budget deficit would almost certainly increase inflationary pressures, with the accompanying dangers of a new round of inflation-induced U.S. private and developing nation debt build-up and more serious adjustment problems in the future. In addition, with U.S. interest rates largely deregulated, renewed inflation would likely increase interest rates, and the resulting interest cost on the currently outstanding U.S. government debt of over one trillion dollars could rapidly increase annual budget deficits.

As an indication of the changing U.S. budget situation, the annual federal budget deficit in 1979 was approximately $28 billion. With a sharp reduction in income tax rates and continued high government spending, it rose to $110 billion by 1982 and several analysts indicate it will likely continue near the $200 billion level for the next few years unless major fiscal policy changes occur. With high real interest rates, the strong U.S. dollar, severe financial pressures in U.S. agriculture, and pressures on other industries sensitive to import competition, hard choices will soon be needed in dealing with this problem. Its resolution will likely require both an increase in taxes and a reduction in government spending.[38]

Side benefits from dealing with the exchange rate problem would likely include lower real interest rates, with a resulting decline in interest-related cost pressures on U.S. agriculture and somewhat increased U.S. private investment. Lower real interest rates also would have positive effects on trade by easing interest cost burdens of developing nations.[39] Dealing with exchange rates through monetary policy alone runs the risk of a sharp and disruptive decline in the value of the U.S. dollar. However, a more balanced fiscal and monetary policy approach would appear less likely to cause such reactions. With the far-reaching exchange rate problems outlined here, U.S. general economic policy developments appear to be at least as important and perhaps more important to U.S. agriculture than changes in its farm price support programs.

Trade Subsidies

Trade subsidies can take several different forms including direct payments to producers and/or processors, price rebates to foreign buyers, subsidized financing terms or outright donations of products or services to foreign importers. Such subsidies typically are used to increase an exporting nation's share of global trade and/or reduce surplus domestic supplies. The U.S. as well as many other nations have used such subsidies from time to time. However, during the past two decades, trade negotiations between the U.S. and trading partners have been aimed at reducing export subsidies as well as other restraints to foreign trade. Current U.S. examples of such subsidies include deficiency payments to grain producers under its target price system, PL 480 export programs and exports of byproduct feed ingredients from the corn milling industry, which are influenced by highway tax exemptions on alcohol fuels.

U.S. trade policy in 1984-85 focused increasingly on grain export subsidies used by the European Community to enable its surplus production to be exported. The U.S. share of global exports of several major agricultural commodities has declined in the past four years, and in some cases the EC share of those same commodity exports has increased. As a reaction to its declining trade shares, the U.S. in mid-1985 implemented an Export Payment-In-Kind Program (Export PIK) initially targeted against EC's subsidized wheat exports. The program involves the granting of bonus quantities from U.S. government-owned grain inventories when designated importers purchase commercial U.S. supplies. Its purpose is to make U.S. commercial agricultural exports competitive with subsidized EC exports. It remains to be seen whether this program will be effective in maintaining U.S. grain trade shares.

One caution should be raised in the use of such trade subsidies, particularly in an environment of relatively static world trade. There is a danger that escalating subsidies could lead to an outright trade war, with each side progressively increasing its subsidies and/or lowering its price to maintain its respective trade share, with each side incurring progressively larger costs and neither gaining significant market advantage.

Export subsidies of U.S. and other major exporters also tend to have a negative impact on the agriculture of grain-importing developing nations. Such subsidies may depress prices in importing nations, thus weakening or removing the incentive for farmers in developing countries to expand production. In the longer run, that could work to the disadvantage of consumers in recipient nations by limiting their nation's ability to become self-sufficient in food production. With these potential disadvantages, it is advisable to use trade subsidies with considerable caution. Such tools should not be expected to solve current food trade problems arising from excessive indebtedness, slow global economic growth, or overvalued currencies.

Debt Problems of Developing Nations

Developing country debt problems are interrelated with factors causing the recent strong U.S. dollar. Dealing with the exchange rate problem thus should provide partial relief to heavily indebted nations. However, lower real interest rates alone will not completely resolve debt burdens. Many developing nation loans are very short term in nature. Increasing their repayment period also has been and will continue to be an important tool in helping such countries through current financial difficulties.[40] Other potentially important tools include more restrained monetary and fiscal policies in developing nations and policy measures designed to improve productivity of the economies involved. While the task is a difficult one that will require caution, moderation and a few more years of adjustment, the outcome is critically important for the world economy. Widespread inability of developing countries to meet debt repayment commitments could endanger multinational lending agencies and risk serious disruption of the world monetary system. Resolution of these problems also will be important for agricultural exporting nations as well as for the physical well-being of people living in developing countries. These nations as a group were one of the fastest growing import markets for farm products during the 1970s. With policies leading to economic stability and growth, they may well offer significant growth in demand for U.S. farm products later in this decade or in the early 1990s.

Trade Protectionism

In today's world economy, there are strong pressures for increased protection of domestic industries against foreign imports. For example, the EC has threatened to place limitations on its annual imports of corn gluten feed and meal. In the United States, "domestic content" legislation has been considered, which would require specific percentages of materials in goods sold in the United States to be produced domestically. In addition, voluntary restraints on Japanese exports of autos into the United States have been in effect the last few years. These are only three examples of a large list of current and/or proposed protectionist trade policies. A recent Washington University study indicates such restrictions currently cost United States consumers $58.5 billion annually in the form of "hidden taxes" along with additional long-run costs through reduced incentives for innovation and improved productivity.[41] With high unemployment, strong foreign competition, and domestic political pressures, most major trading nations are facing increased pressure to protect domestic industries through trade restrictions. However, the lessons of the 1930s should be a strong reminder that protectionism leads to declining trade and sluggish world economic activity.[42] It should also be recognized that trade requires two-way exchange between nations. One nation's exports generates revenue that is used to purchase its trading partner's products. In short, U.S. agriculture and the U.S. economy have an important stake in resisting current tendencies toward increased trade protectionism.

Food Security

Food security is a critical and complex policy issue for much of the developing world. One aspect of the problem is illustrated by estimates that the caloric intake of more than 800 million people or 60 percent of the population of less developed nations is below the standards established by the United Nations Food and Agricultural Organization and the World Health Organization.[43] These estimates do not reflect quality dimensions of diets in less developed countries such as protein levels and other nutritional requirements.

Another view of current world food security is illustrated by food security standards for grain carryover stocks. Some world food authorities place minimum stock levels for food security purposes at 17 to 18 percent of global annual utilization.[44] Global carryover stocks in 1985 are estimated at 14 percent of annual utilization, slightly below the minimum standard.[45] However, this standard is only a general guideline. The geographic distribution of stocks is important from a food security standpoint and also can have a considerable effect on prices paid to producers in exporting countries if stocks are concentrated in a few major exporting regions.

Short-run dimensions of food security are largely oriented toward meeting emergency food needs resulting from drought or other natural disasters. Issues still to be resolved here include the desired size and locations of reserve stocks, methods of sharing storage costs, and methods of acquiring and releasing stocks to minimize disruptions in importer and exporter nations. These issues are especially important for the people of Sub-Saharan Africa, the Indian sub-continent and parts of Latin America.[46]

Long-run dimensions of food security include policies for increasing food production in developing nations and other areas, improved distribution, and population trends. Uneven distribution of food reflects severe poverty in many areas. In fact, poverty and distribution problems can be viewed as major elements in the current world food problem because global food production is sufficient to adequately meet the needs of the world's current population.[47] Dealing effectively with these areas will be a major challenge for current and future generations. Its importance is highlighted by the fact that the third world has been the flashpoint for East-West conflicts.[48] In other words, food security, poverty or economic well being, and world peace are closely interrelated.

Other Policy Issues

Other important trade-related policy issues include the growing use of bilateral trade agreements, strategies for encouraging expanded agricultural production in developing nations, and tax or subsidy policies, which some nations use to enhance competitiveness of value-added export industries. Use of bilateral agreements in world grain and oilseed trade has expanded rapidly since the United States first entered into a long-term grain agreement with USSR in 1976. Such agreements typically specify minimum annual quantities of product that exporting nations agree to provide to importers and importers agree to receive. Several of these agreements are being used by Canada, Argentina, Australia, and other grain exporting nations. The United States has a similar agreement with Mexico, although its grain trade agreement with China was allowed to expire at the end of 1984.

Bilateral agreements tend to bypass normal market functions of discouraging utilization when prices are high and encouraging utilization when prices are low. As use of long-term agreements grows, an increasing portion of the world grain market will be restricted to some degree from performing its normal market clearing and market rationing functions. In this setting, market areas not subject to these and other artificial restraints may be forced to bear an increasing share of the adjustment to changing world grain and oilseed supplies—with a resulting increase in price volatility in such markets. The trend toward expanded use of long-term trade agreements thus may have important implications for developing nations that import grain and are not covered by long-term agreements, and for U.S. grain and livestock producers.

Expansion of production in developing nations is a complex and sometimes controversial problem that cuts across cultural, political, technological, and economic disciplines. Progress in this area will be important in meeting long-term food needs of the world's poorest nations. These countries presently have extremely limited ability to buy U.S. farm products.

One example of policies encouraging exports of value-added products is the soybean industry in EC and Brazil. As noted in an earlier section of this report, the U.S. share of global soybean products has dropped substantially in recent years while these two areas have enjoyed a sharply rising share. Because the U.S. soybean processing industry has substantial excess capacity, this issue appears likely to receive additional attention in the next few years. Brazil encourages exports of processed products rather than soybeans by differential export taxes, with a larger tax on soybean exports than on exports of soybean products, as well as by export quotas on soybeans, subsidized interest rates for processors and duty-free imports of equipment used in production of export goods.[49] In the EC, a modest import tax is applied to soybean oil, thus favoring imports of soybeans for processing rather than imports of both meal and oil. The processing industries in these three areas appear to be moving closer to a confrontation, and this issue may be one of many trade policy questions coming to the forefront in the late 1980s.

Notes

1. Based on U.S. Department of Agriculture, Foreign Agricultural Service, "Rice Trade and Economy of Selected Asian Countries, 1970 to the Present," *Foreign Agriculture Circular, Grains*, FG 15-84 (Washington, D.C.) December 1984.

2. S. Mielke, "World Supply, Demand and Competition for Soybeans and Products in the Eighties and Nineties," *World Soybean Research Conference-III; Proceedings;* edited by R. Shibles, Westview Press (Boulder, Colorado), September 1985, pp. 51-62.

3. For estimates of U.S. land potentially available for conversion to cropland and a discussion of other trends in U.S. agricultural land utilization, see R. W. Hexem and W. D. Anderson, U.S. Department of Agriculture, Economic Research Service, *Cropland Use and Supply*, CUS-1 (Washington, D.C.), September 1984.

4. For oil and meal yields of various oilseeds, see U.S. Department of Agriculture, Economic Research Service, *U.S. Fats and Oil Statistics 1961-76;* Statistical Bulletin No. 574 (Washington, D.C.), June 1977, pp. 120-126.

5. Reuters News Service, "EC Corn Gluten Use Forecast Steady to Higher" (London, England), May 31, 1985.

6. Anthony Phelps, "Milk Quotas Cut U.K. Sales of Cattle Feed 20%: Feedman," *Feedstuffs;* Vol. 57, No. 19, (Minneapolis, Minn.), May 13, 1985, p. 11.

7. See Gary W. Williams and R. L. Thompson, *The Brazilian Soybean Industry, Economic Structure and Policy Interventions*, U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Economic Report No. 200*, (Washington, D.C.), October 1984; and Williams and Thompson, "The South American Soybean Industry: Policy Impacts and Issues," *World Soybean Research Conference-III, Proceedings* edited by R. Shibles, Westview Press (Boulder, Colorado) September 1985, for a discussion of policies used by Brazil to encourage value added exports.

8. Based on Council, Food and Agricultural Organization of the United Nations, 86th Session, *The State of Food and Agriculture, 1984* (Rome, Italy) November 19-30, 1984, pp. 22-24.

9. U.S. Department of Agriculture, Economic Research Service, *USSR Outlook and Situation Report;* RS 4-85, (Washington, D.C.) April 1985, p. 29.

10. *Ibid.*, p. 27.

11. *Ibid.*

12. *Ibid.*, p. 26.

13. U.S. Department of Agriculture, Foreign Agricultural Service, *Grains, USSR Grain Situation and Outlook*, Foreign Agriculture Circular, S6 4-85 (Washington, D.C.), April 1985, p. 10.

14. Based partly on U.S. Department of Agriculture, Economic Research Service, *World Agricultural Outlook and Situation Report*, WAS-39 (Washington, D.C.), March 1985.

15. Matthew D. Shane and David Stallings, "Financial Constraints to Trade and Growth, The World Debt Crisis and Its Aftermath," U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Economic Report No. 211* (Washington, D.C.), December 1984.

16. Federal Reserve Bank of Chicago, "International Debt of Developing Countries" *International Letter* No. 518, (Chicago, Illinois), January 27, 1984; and Andres Oppenheimer, "Latin America on Slow Road to Recovery," *Journal of Commerce*, (New York, N.Y.), May 6, 1985.

17. See R. N. Wisner and C. A. Chase, *World Food Trade and U.S. Agriculture*, 4th annual ed., World Food Institute, Iowa State University (Ames, Iowa), August, 1984, p. 60-63; and Toepfer International, *The E.E.C. Grain Market Regulations 1982-83* and *The E.E.C. Grain Market Regulations, 1984* (Hamburg, Federal Republic of Germany), September 1982 and September 1984.

18. U.S. Department of Agriculture, Economic Research Service, "World Economic Outlook," *Agricultural Outlook* (Washington, D.C.), March 1985. Indicates the average inflation for Canada, Japan, France, West Germany, Italy, the Netherlands, and the U.K. in the last half of 1984 was at a rate of approximately 3.9 percent.

19. For a review of changes in the international monetary mechanism from the post World War II period through the 1970s see Victor Agry, *The Postwar International Money Crisis: An Analysis* (London, U.K.: George Allen & Unwin), 1981.

20. Data for this section were obtained from Food and Agriculture Organization of the United Nations, *Production Yearbook;* (Rome, Italy), various issues. For other aspects of the African food situation, see Food and Agricultural Organization of the United Nations, *Council, Eighty-sixth Session, The State of Food and Agriculture 1984* (Rome, Italy), November 1984, pp. 46-72.

21. For a discussion of factors and policies affecting domestic EC grain feeding trends, see Dale J. Leuck, *Analysis of the Feed-Livestock Sector of the European Community*, U.S. Department of Agriculture, Economic Research Service, ERS Staff Report No. AGES840529; (Washington, D.C.) January 1985. See also F. Duchene, E. Szczepanik and W. Legg, *New Limits on European Agriculture, Politics and the Common Agricultural Policy*, Rowman and Allenheld (Totowa, New Jersey), July 1985, for a discussion of factors behind the EC's emergence as a major agricultural exporter. Other references on EC Agriculture and Policies include Robert J. Bevins, *The European Common Market*, Public Policy 4, Kansas State University Extension Service, (Manhattan, Kansas) September 1963; Thomas Vankai, "EC Cap: Goals, Problems, and Results," U.S. Department of Agriculture, Foreign Agriculture Service, *Foreign Agriculture*, (Washington, D.C.) September 1980; Miles J. Lambert, "Greek Entry Into the EC Launches Decade of Growth and Changing Focus," U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture* (Washington, D.C.), January 1981; Dr. Hans-Broder Krohn, Head of EEC Commission's Directorate of Agricultural Economics and Legislation, "The Common Agricultural Policy," *Common Market Farm Report*, No. 31, European Community Information Service, Washington Office (Washington, D.C.), May 4, 1967; William P. Roenizk, *Agriculture in the European Community and the United States*, 1958-68, ERS-Foreign 307 (Washington, D.C.), April 1971, John F. Hudson, *The Common Agricultural Policy of the European Community*, U.S. Department of Agriculture, Foreign Agricultural Service, FAS M-255 (Washington, D.C.), November 1973; Robert N. Wisner and Joseph R. Corley, editors, *Marketing Soybeans and Soybean Products Around the World*, M-1137, Iowa State University (Ames, Iowa), July 1972; and Reed E. Friend, "Agricultural Policy Issues in the EC and Their Implications for U.S. Interests," *Agricultural Outlook*, U.S. Department of Agriculture, Economic Research Service (Washington, D.C.), January-February 1984, pp. 20-34.

22. P. H. Calkins and J. C. Ma, "Soybeans and Cropping Patterns in China," in *World Soybean Research Conference-III; Proceedings*, edited by R. Shibles; Westview Press, 1985. See Carolyn Whitten, "China Market: Import Growth Slowing," U.S. Department of Agriculture, Economic Research Service, *Agricultural Outlook* (Washington, D.C.), April 1983, pp. 22-23 for a discussion of other factors affecting Chinese grain trade prospects. See also U.S. Department of Agriculture, Economic Research Service, "China's Agricultural Revolution: From Customer to Competitor," *Agricultural Outlook;* (Washington, D.C.), March 1985, pp. 23-26.

23. Wisner and Chase, p. 41.

24. U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), November-December 1980.

25. U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), December 1975; and January-February 1983.

26. *Ibid.*

27. U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), January-February 1983 and January-February 1981.

28. Based partly on U.S. Department of Agriculture, Economic Research Service, *Agricultural Outlook* (Washington, D.C.), December 1982, p. 14.

29. U.S. Wheat Associate, *Wheat Letter;* (Washington, D.C.), April 4, 1985.

30. For a discussion of the principle of comparative advantage, see C. P. Kindleberger, *International Economics*, 6th Ed., (Richard D. Irwin, Inc.: Homewood, Illinois), 1978, pp. 16-23.

31. Phelps, p. 11

32. Reuters News Service, "EC Corn Gluten Use Forecast Steady to Higher" (London, England), May 31, 1985.

33. U.S. Department of Agriculture, Foreign Agriculture Service, *Foreign Agriculture Circular, Oilseeds and Products*, FOP 4-85 (Washington, D.C.), April 1985.

34. Mielke, pp. 51-62.

35. For a discussion of factors affecting grain stocks in United States, Canada and Australia, see Carol A. Goodloe, "Grain Stock Policy in the U.S., Canada and Australia," U.S. Department of Agriculture, Economic Research Service, *North America and Oceania, Outlook and Situation Report*, RS 84-1 (Washington, D.C.), 1984, pp. 26-31.

36. See U.S. Department of Agriculture, Economic Research Service, "Formation of the 1985 Farm Bill," *Agricultural Outlook;* (Washington, D.C.), June 1985, for a listing of recent U.S. agricultural policy proposals.

37. Jim Longmire and Art Morey, "Strong Dollar Dampens Demand for U.S. Farm Exports," U.S. Department of Agriculture, Economic Research Servicle, *Foreign Agriculture Economics Report* No. 193 (Washington, D.C.), December 1983. See also Dennis Starleaf, "Macroeconomic Policies and Their Impact Upon the Farm Sector," *American Journal of Agricultural Economics*, 60:854-860.

38.-For a discussion of U.S. monetary and fiscal policy and its impact on agriculture, see Dean W. Hughes and Marvin Duncan, "Monetary and Fiscal Policy Connections to Agriculture" in *The Farm and Food System in Transition*, FS7, Resource Paper sponsored by Extension Committee on Policy, U.S. Department of Agriculture, Michigan State University Cooperative Extension Service (East Lansing, Michigan), 1983.

39. For interrelationships and economic policies affecting world economic growth, see A. C. Harberger, *World Economic Growth*, Institute for Contemporary Studies; (San Francisco, California), January 1985.

40. From a speech by Alexander Good, deputy Assistant Secretary for International Economic Policy, U.S. Department of Commerce, at an International Trade Conference, Des Moines, Iowa, May 31, 1984.

41. Michael C. Munger and Kathleen A. Rehbein, "The High Cost of Protectionism," *Europe*, Delegation of the Commission of the European Communities (Washington, D.C.), No. 243, May-June 1984, pp. 10-11.

42. Jimmye S. Hillman, "Policy Issues Relevant to United States Agricultural Trade" in Alex F. McCalla and Timothy E. Josling, *Imperfect Markets in Agricultural Trade* (Allanheld, Osmun; Montclair, New Jersey), 1981, p. 113-142.

43. S. Reutlinger and H. Alderman, "The Prevalence of Calorie-Deficient Diets in Developing Countries," *World Development*, 1980, Vol. 8, pp. 399-411.

44. Munich-Weihenstephan, "Objective Indicators of Large-Scale Food Shortages?" *Review of International Trade and Development* (Hamburg, Federal Republic of Germany), July-August 1981, pp. 178-182.

45. U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agricultural Circular, Grains*, FG 9-85 (Washington, D.C.), June 1985.

46. For further discussion on these and related issues, see Munich-Weihenstephan, *Op. Cit.;* David Bigman, *Coping with Hunger; Toward a System of Food Security and Price Stabilization* (Ballinger Publishing Co.; Cambridge, Massachusetts), 1982; U.S. Department of Agriculture, Economic Research Service, *Problems and Prospects in Sub-Saharan Africa*, Foreign Agricultural Economic Report No. 166 (Washington, D.C.), 1981; U.S. Department of Agriculture, Economic Research Service, *World Food Aid Needs and Availabilities*, 1982 (Washington, D.C.), April 1982; and Richard Gilmire and Barbara Huddleston, "The Food Security Challenge," *Food Policy*, Vol. 8, No. 1, February 1983, pp. 31-45.

47. See Bigman, for a discussion of these issues.

48. Speech by Frank Vogel, Director of Information and Public Affairs, World Bank, at an International Trade Conference, Des Moines, Iowa, May 31, 1984.

49. Wipada S. Huyser, *A Regional Analysis of Trade Policies Affecting the Soybean and Soybean Meal Market*, Unpublished Ph.D. dissertation, Department of Economics, Iowa State University (Ames, Iowa), 1983.

Bibliography

Agry, Victor. *The Postwar International Money Crisis: An Analysis*. (George Allen & Unwin: London, U.K.), 1981.

Bevins, Robert J. *The European Common Market*, Public Policy 4. (Kansas State University Extension Service: Manhattan, Kansas), September 1963.

Bigman, David. *Coping with Hunger: Toward a System of Food Security and Price Stabilization*. (Ballinger Publishing Co.: Cambridge, Massachusetts), 1982.

Calkins, P. H. and J. C. Ma. "Soybeans and Cropping Patterns in China," in *World Soybean Research Conference-III Proceedings*, edited by R. Shibles. (Westview Press: Boulder, Colorado), 1985.

Duchene, F., E. Szczepanik, and W. Legg. *New Limits on European Agriculture, Politics and the Common Agricultural Policy*. (Rowman and Allenheld: Totowa, New Jersey), July 1985.

Federal Reserve Bank of Chicago. "International Debt of Developing Countries." *International Letter*, No. 518 (Chicago, Illinois), January 27, 1984.

Food and Agriculture Organization of the United Nations. *Council, Eighty-sixth Session, The State of Food and Agriculture 1984*. (Rome, Italy), November 1984, p. 46-72.

Food and Agriculture Organization of the United Nations. *Food Outlook*. (Rome, Italy), No. 2, February 27, 1984; No. 3, April 1985; and *1983 Statistical Supplement*, March 1984.

Food and Agriculture Organization of the United Nations. *Production Yearbook*. (Rome, Italy), various issues.

Food and Agriculture Organization of the United Nations. *The State of Food and Agriculture*. (Rome, Italy), 1983.

Food and Agricultural Organization of the United Nations. *Trade Yearbook*. (Rome, Italy), various issues.

Friend, Reed E. "Agricultural Policy Issues in the EC and Their Implications for U.S. Interests." *Agricultural Outlook*, U.S. Department of Agriculture, Economic Research Service. (Washington, D.C.), January-February 1984, pp.20-34.

Gilmore, Richard and Barbara Huddleston. "The Food Security Challenge." *Food Policy*, Vol. 8, No. 1, February 1983, pp. 31-45.

Goodloe, Carol A. "Grain Stock Policy in the U.S., Canada and Australia." *North America and Oceania, Outlook and Situation Report*, RS-84-1. (U.S. Department of Agriculture, Economic Research Service: Washington, D.C.), 1984, pp. 26-31.

Harberger, A. C. *World Economic Growth*. (Institute for Contemporary Studies: San Francisco, California), January 1985.

Hexem, R. W. and W. D. Anderson. *Cropland Use and Supply*, CUS-1. (U.S. Department of Agriculture, Economic Research Service: Washington, D.C.), September 1984.

Hillman, Jimmye S. "Policy Issues Relevant to United States Agricultural Trade" in McCalla, Alex. F. and Josling, Timothy E., *Imperfect Markets in Agricultural Trade*. (Allanheld, Osmun: Montclair, New Jersey), 1981, p. 113-142.

Hudson, John F. *The Common Agricultural Policy of the European Community*, FAS M-255 (U.S. Department of Agriculture, Foreign Agricultural Service, Washington, D.C.), November 1973.

Hughes, Dean W. and Marvin Duncan. "Monetary and Fiscal Policy Connections to Agriculture" in *The Farm and Food System in Transition*, FS7. Resource Paper sponsored by Extension Committee on Policy. (U.S. Department of Agriculture, Michigan State University Cooperative Extension Service: East Lansing, Michigan), 1983.

Huyser, Wipada S. *A Regional Analysis of Trade Policies Affecting the Soybean and Soybean Meal Market*. Unpublished Ph.D. dissertation, Department of Economics. (Iowa State University: Ames, Iowa), 1983.

Journal of Commerce. (New York, New York), Vol. 364 No. 25, 969, May 6, 1985, p. 6A.

Kindleberger, C. P. *International Economics*, Sixth Edition. (Richard D. Irwin, Inc.: Homewood, Illinois), 1978, pp. 16-23.

Krohn, Dr. Hans-Broder, head of EEC Commission's Directorate of Agricultural Economics and Legislation. "The Common Agricultural Policy," *Common Market Farm Report*, No. 31. (European Community Information Service, Washington Office: Washington, D.C.), May 4, 1967.

Lambert, Miles J. "Greek Entry Into the EC Launches Decade of Growth and Changing Focus," *Foreign Agriculture*. (U.S. Department of Agriculture, Foreign Agricultural Service: Washington, D.C.), January 1981.

Leuck, Dale J. *Analysis of the Feed-Livestock Sector of the European Community*, ERS Staff Report No. AGES840529. (U.S. Department of Agriculture, Economic Research Service: Washington, D.C.), January 1985.

Longmire, Jim and Art Morley. *Strong Dollar Dampens Demand for U.S. Farm Exports*, FAER 193. (U.S. Department of Agriculture, Economic Research Service, Washington, D.C.), December 1983.

Mielke, S. "World Supply, Demand and Competition for Soybeans and Products in the Eighties and Nineties," in *World Soybean Research Conference-III; Proceedings*, edited by R. Shibles, (Westview Press: Boulder, Colorado), September 1985, p. 51 (62).

Munger, Michael C. and Kathleen A. Rehbein. "The High Cost of Protectionism," *Europe*, No. 243. (Delegation of the Commission of the European Communities: Washington, D.C.), May-June 1984, pp. 10-11.

Munich-Weihenstephan. "Objective Indicators of Large-Scale Food Shortages?" *Review of International Trade and Development*. (Hamburg, Germany), July-August 1981, pp. 178-182.

Oppenheimer, Andres. "Latin America on Slow Road to Recovery," *Journal of Commerce*. (New York, New York), May 6, 1985.

Phelps, Anthony. "Milk Quotas Cut U.K. Sales of Cattle Feed 20%: Feedman," *Feedstuffs* (Minneapolis, Minnesota), May 13, 1985, Vol. 57, No. 19, p. 11.

Reuters News Service. "EC Corn Gluten Use Forecast Steady to Higher" (London, England), May 31, 1985.

Reutlinger, S. and H. Alderman. "The Prevalence of Calorie-Deficient Diets in Developing Countries," *World Development*. 1980, Vol. 8, pp. 399-411.

Roenick, William P. *Agriculture in the European Community and the United States, 1958-68*, ERS-Foreign 30. (Washington, D.C.), April 1971.

Shane, Matthew D. and David Stallings. *Financial Constraints to Trade and Growth, The World Debt Crisis and Its Aftermath*, Foreign Agricultural Economic Report No. 211. (U.S. Department of Agriculture, Economic Research Service: Washington, D.C.), December 1984.

Starleaf, Dennis. "Macroeconomic Policies and Their Impact Upon the Farm Sector," *American Journal of Agricultural Economics*. 60:854-860.

Statistical Annual Chicago Board of Trade. (Chicago Board of Trade: Chicago, Illinois) various issues.

Toepfer International. *The E.E.C. Grain Market Regulation 1982/83.* (Hamburg, Federal Republic of Germany), September 1982.

U.S. Department of Agriculture. Agricultural Marketing Service. *Feed Market News.* (Independence, Missouri), various issues.

U.S. Department of Agriculture. Agricultural Marketing Service. *Grain Market News.* (Independence, Missouri), various issues.

U.S. Department of Agriculture. Agricultural Marketing Service. *Grain and Feed Market News.* (Independence, Missouri), various issues.

U.S. Department of Agriculture. Economic Research Service. *Agricultural Outlook.* (Washington, D.C.), December 1982, March 1985, June 1985.

U.S. Department of Agriculture. Foreign Agricultural Service. *Foreign Agriculture Circular, Oilseeds and Products.* (Washington, D.C.), FOP 4-85, April 1985; FOP 25-77, December 1977; FOP 5-83, May 1983; FOP 4-83, April 1983; FOP 4-84, April 1984; FOP 4-78, April 1978; FOP 5-85, May 1985; FOP 11-82, September 1982, FOP 16-81, September 1981; FOP 1-81, January 1981; FOP 10-80, May 1980; FOP 2-84, February 1984; FOP 11-83, November 1983; FOP 9-83, September 1983; FOP 13-82, November 1982; FOP 4-81, March 1981; FOP 9-82, July 1982; FOP 6-84, June 1984; FOP 6-85, June 1985.

U.S. Department of Agriculture. Foreign Agricultural Service. *Foreign Agriculture Circular, World Crop Production.* (Washington, D.C.), WCP 4-85, April 11, 1985; WCP 4-82, April 12, 1982; WCP s3-84, March 9, 1984; WCP 6-82, May 10, 1982.

U.S. Department of Agriculture. Foreign Agricultural Service. "Notice to Recipients: Summary of FY 83 and FY 84 Export Values and Quantities for GSM-102 and Blended Credit." Unpublished Material. (Washington, D.C.), January 1985.

U.S. Department of Agriculture. Foreign Agricultural Service. "Summary of Exports (GSM-101; GSM-102; GSM-201; GSM-301)"; unpublished material (Washington, D.C.), December 1982.

U.S. Department of Agriculture. Statistical Reporting Service. *Crop Production, 1984 Summary,* crpr 2-1 (85). (Washington, D.C.), January 1985, and various other issues

U.S. Department of Agriculture, Statistical Reporting Service. *Field Crops,* Statistical Bulletin Number 708. (Washington, D.C.), and various other issues.

U.S. Wheat Associate. *Wheat Letter.* (Washington, D.C.), April 4, 1985.

Vankai, Thomas. "EC Cap: Goals, Problems, and Results," *Foreign Agriculture.* (U.S. Department of Agriculture, Foreign Agriculture Service: Washington, D.C.), September 1980.

Wall Street Journal. (Chicago, Illinois), various issues.

Whitten, Carolyn. "China Market: Import Growth Slowing," *Agricultural Outlook.* (U.S. Department of Agriculture, Economic Research Service: Washington, D.C.), April 1983, pp. 22-23.

Williams, Gary W. and R. L. Thompson. *The Bazilian Soybean Industry, Economic Structure and Policy Interventions,* Foreign Agricultural Economic Report, Number 200. (U.S. Department of Agriculture, Economic Research Service: Washington, D.C.), October 1984, and Williams, Gary W. and Thompson, R. L., "The South American Soybean Industry: Policy Impacts and Issues" in *World Soybean Research Conference-III Proceedings* edited by R. Shibles. (Westview Press: Boulder, Colo.) September 1985 for a discussion of policies used by Brazil to encourage value-added exports.

Wisner, R. N. and C. A. Chase. *World Food Trade and U.S. Agriculture,* Fourth Annual Edition. (World Food Institute, Iowa State University: Ames, Iowa), August 1984, pp. 60-63.

Wisner, Robert N. and Joseph R. Corley. ed., *Marketing Soybeans and Soybean Products Around the World,* M-1137. (Iowa State University: Ames, Iowa), July 1972.

U.S. Department of Agriculture. Economic Research Service. *Foreign Agricultural Trade of the United States.* (Washington, D.C.), January-February 1985, March-April 1985, November-December 1984, November-December 1980, December 1975, and January-February 1983, January-February 1981, November-December 1983, November-December 1982, November 1977.

U.S. Department of Agriculture. Economic Research Service. *Problems and Prospects in Sub-Saharan Africa,* Foreign Agricultural Economic Report No. 166. (Washington, D.C.), 1981.

U.S. Department of Agriculture. Economic Research Service. *U.S. Fats and Oil Statistics 1961-76,* Statistical Bulletin No. 574. (Washington, D.C.), June 1977, p. 120-126.

U.S. Department of Agriculture. Economic Research Service. *USSR Outlook and Situation Report;* RS-85-4. (Washington, D.C.) April 1985, p. 29.

U.S. Department of Agriculture. Economic Research Service. *World Agricultural Outlook and Situation Report,* WAS-39. (Washington, D.C.), March 1985.

U.S. Department of Agriculture. Economic Research Service. "World Economic Outlook" in *Agricultural Outlook.* (Washington, D.C.), March 1985.

U.S. Department of Agriculture. Economic Research Service. *World Food Aid Needs and Availabilities, 1982.* (Washington, D.C.), April 1982.

U.S. Department of Agriculture. Foreign Agricultural Service. *Foreign Agricultural Circular, Dairy Livestock and Poultry Situation,* FL & P-1 85. (Washington, D.C.), April 1985.

U.S. Deoartment of Agriculture. Foreign Agricultural Service. *Foreign Agriculture Circular, Grains.* (Washington, D.C.), FG 7-85, May 1985; FG 6-85, April 1985; FG 13-82, April 26, 1982; FG 16-75, December 22, 1975; FG 7-77, July 1977; FG 10-74, April 1974; FG 25-76, October 7, 1976, FG 4-83, Febuary 15, 1983; SG 5-85, May 1985; FG 20-78, November 1978; FG 24-79, December 13, 1979; FG 5-80, February 1980; FG 4-81, January 1981; FG 26-83, September 9, 1983; FG 9-76, May 1976; FG 19-83, November 8, 1983; FG 2-85, January 1985; FG 37-82, December 8, 1982; FG 21-83, July 14, 1983; FG 81-84, May 1984; SG 4-85, April 1985; FG 15-84, December 1984, FG 9-84, June 1984; FG 23-82, July 1982; FG 10-83, April 12, 1983; SG 8084, June 12, 1984; FG 9-85, June 1985.

U.S. Department of Agriculture. Foreign Agricultural Service. *Foreign Agricultural Circular, Livestock and Meat.* (Washington, D.C.), FLM 2-81, February 1981; FLM 2-80, February 1980; FLM 10-78, September 1978; and FLM 9-78, September 1978.

U.S. Department of Agriculture. Foreign Agricultural Service. *Foreign Agriculture Circular, Livestock and Poultry Situation.* (Washington, D.C.), FL&P 2-83, May 1983; and FL&P 1-84, April 1984; FL&P 1-82, April 1982.

Appendix I. Food Production and Population Trends by Economic and Geographic Classifications of Countries

Classification of Countries by Economic Category

Developed Market Economies

1. Australia
2. Austria
3. Canada
4. Denmark
5. Finland
6. West Germany
7. France
8. Iceland
9. Ireland
10. Italy
11. Japan
12. Luxembourg and Belgium
13. The Netherlands
14. Norway
15. Sweden
16. Switzerland
17. United Kingdom
18. United States

Rapidly and Moderately Developing Nations

1. Algeria
2. Argentina
3. Bolivia
4. Brazil
5. Cameroon
6. Chile
7. Colombia
8. Congo
9. Costa Rica
10. Cyprus
11. Dominican Republic
12. Ecuador
13. Egypt
14. El Salvador
15. Ghana
16. Greece
17. Guatemala
18. Honduras
19. India
20. Indonesia
21. Iran
22. Iraq
23. Israel
24. Ivory Coast
25. Jamaica
26. Jordan
27. Korea (South)
28. Kuwait
29. Lebanon
30. Liberia
31. Libya
32. Malaysia
33. Mexico
34. Morocco
35. New Zealand
36. Nicaragua
37. Nigeria
38. Pakistan
39. Panama
40. Papua New Guinea
41. Paraguay
42. Peru
43. Philippines
44. Portugal
45. Puerto Rico
46. Saudi Arabia
47. Senegal
48. Singapore
49. South Africa
50. Spain
51. Syria
52. Taiwan
53. Thailand
54. Trinidad
55. Tunisia
56. Turkey
57. Uruguay
58. Venezuela
59. North Yemen
60. Zambia
61. Zimbabwe

Centrally Planned Economies

1. Albania
2. Angola
3. Bhutan
4. Bulgaria
5. China
6. Cuba
7. Czechoslovakia
8. East Germany
9. Hungary
10. Kampuchea (Cambodia)
11. Korea (North)
12. Laos
13. Mongolia
14. Mozambique
15. Poland
16. Romania
17. South Yemen
18. USSR
19. Vietnam
20. Yugoslavia

Other Developing Nations

1. Afghanistan
2. Bahamas
3. Bahrain
4. Bangladesh
5. Barbados
6. Benin
7. Botswana
8. Burma
9. Burundi
10. Central African Republic
11. Chad
12. Comoros
13. Cape Verde
14. Djibouti
15. Dominica
16. Ethiopia
17. Equatorial Guinea
18. Fiji
19. Gabon
20. The Gambia
21. Grenada
22. Guinea
23. Guinea Bissau
24. Guyana
25. Haiti
26. Kenya
27. Lesotho
28. Madagascar
29. Malawi
30. Maldives
31. Mali
32. Malta
33. Mauritania
34. Mauritius
35. Nepal
36. Niger
37. Oman
38. Qatar
39. Rwanda
40. St. Lucia
41. Sao Tome Principe
42. Seychelles
43. Sierra Leone
44. Solomon
45. Somalia
46. Sri Lanka
47. Sudan
48. Surinam
49. Swaziland
50. Tanzania
51. Togo
52. Uganda
53. United Arab Emirates
54. Upper Volta
55. Western Samoa
56. Zaire

Classification of Countries by Geographic Location

North Africa
Algeria
Chad
Egypt
Ethiopia
Libya
Mali
Mauritania
Morocco
Niger
Sudan
Tunisia

Southern Africa
Namibia (Southwest)
South Africa
Zimbabwe

Sub-Saharan Africa
Angola
Benin
Botswana
Burundi
Cameroon
Cape Verde
Central African Republic
Comoros
Congo
Djibouti
Gabon
Gambia
Ghana
Guinea
Guinea Bissau
Ivory Coast
Kenya
Lesotho
Liberia
Madagascar
Malawi
Mauritius
Mozambique
Nigeria
Reunion
Rwanda
Senegal
Sierra Leone
Somalia
Swaziland
Uganda
Upper Volta
Tanzania
Zaire
Zambia
Zanzibar

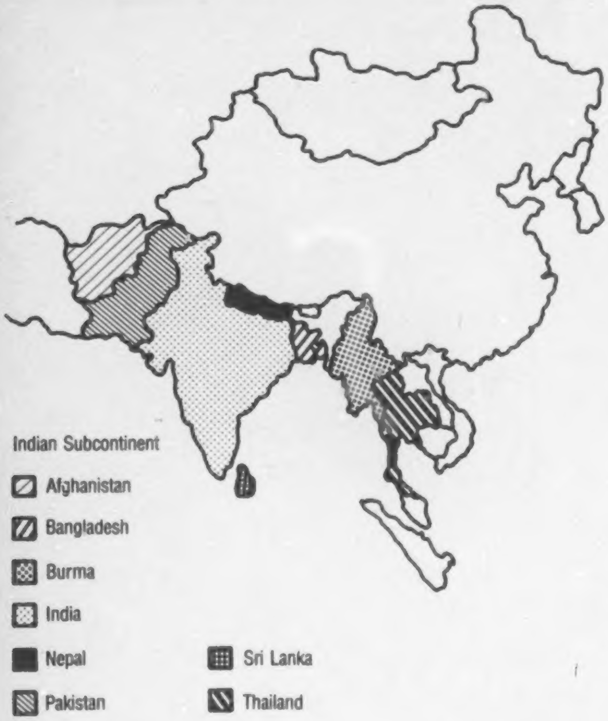
Indian Subcontinent
Afghanistan
Bangladesh
Burma
India
Nepal
Pakistan
Sri Lanka
Thailand

Central America
Antigua
Bahamas
Barbados
Bermuda
British Honduras
Costa Rica
Cuba
Dominican Republic
El Salvador
Grenada
Guatemala
Guadeloupe
Haiti
Honduras
Jamaica
Martinique
Montserrat
Netherlands Antilles
Nicaragua
Panama
Puerto Rico
Trinidad and Tobago
United States Virgin Islands

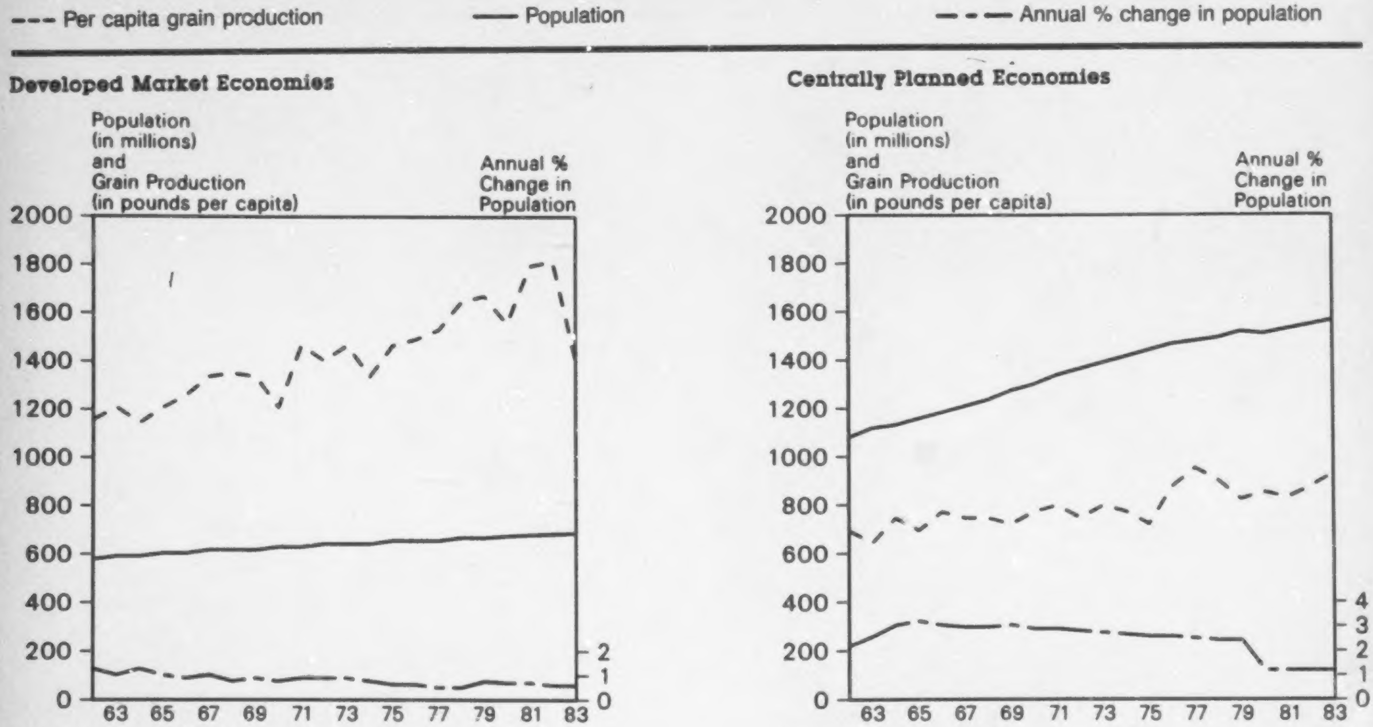
South America
Argentina
Bolivia
Brazil
Chile
Colombia
Ecuador
French Guiana
Guyana
Paraguay
Peru
Surinam
Uruguay
Venezuela

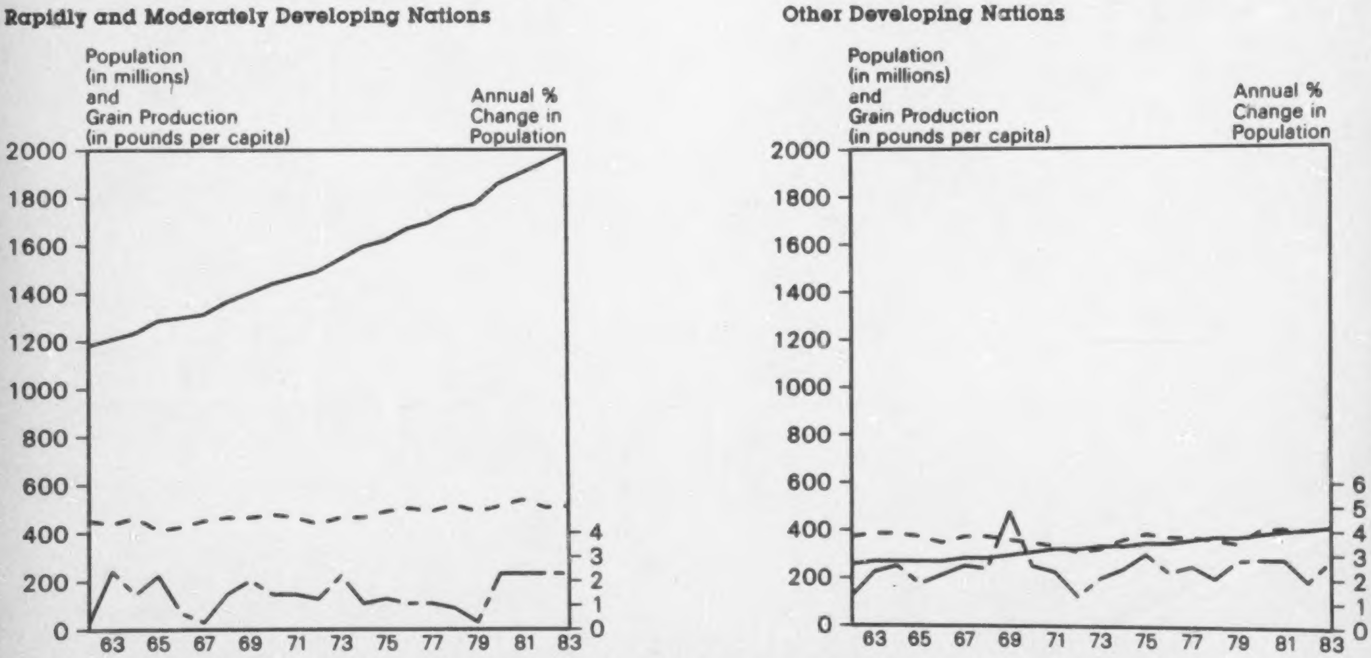
Others
Mexico

Appendix I, Map I. Countries in the Indian Subcontinent.


Indian Subcontinent
Afghanistan
Bangladesh
Burma
India
Nepal
Pakistan
Sri Lanka
Thailand

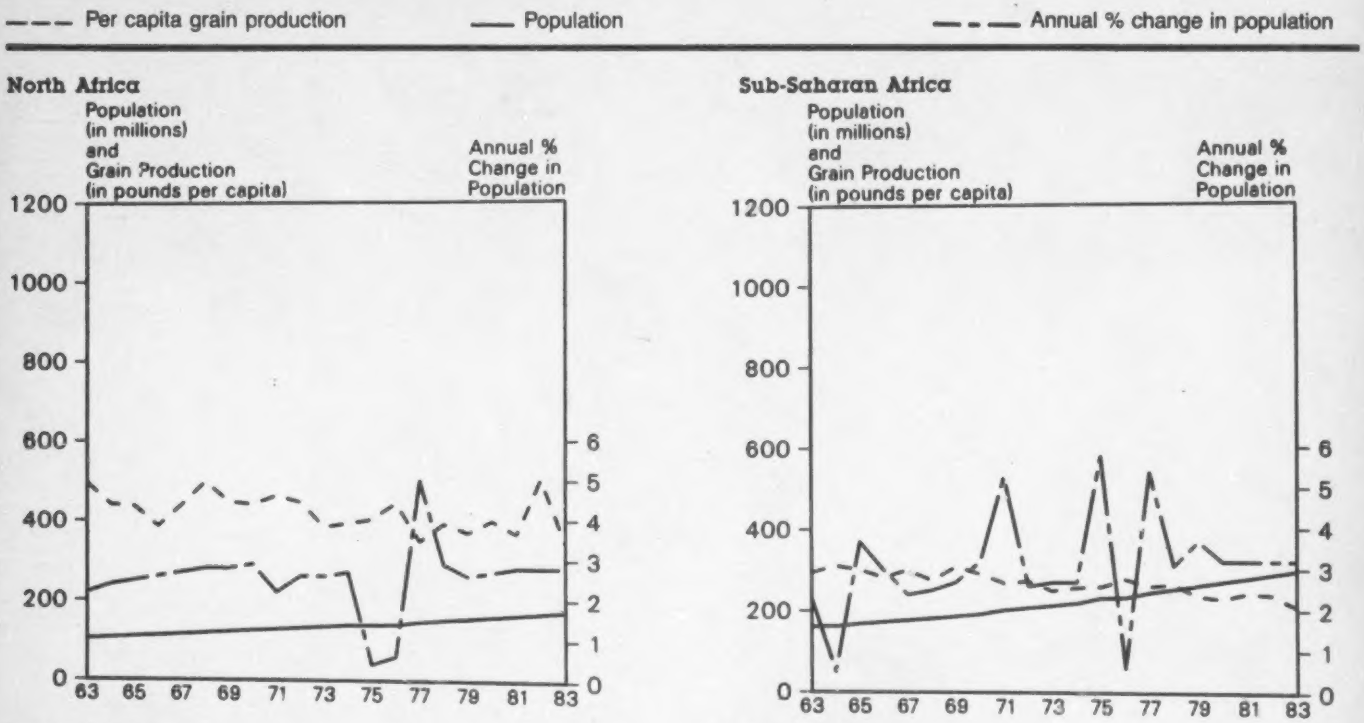
Appendix I, Figure 1. Trend in Population, Population Growth Rates, and Per Capita Grain Production by Economic Groupings of Nations, 1963-83.





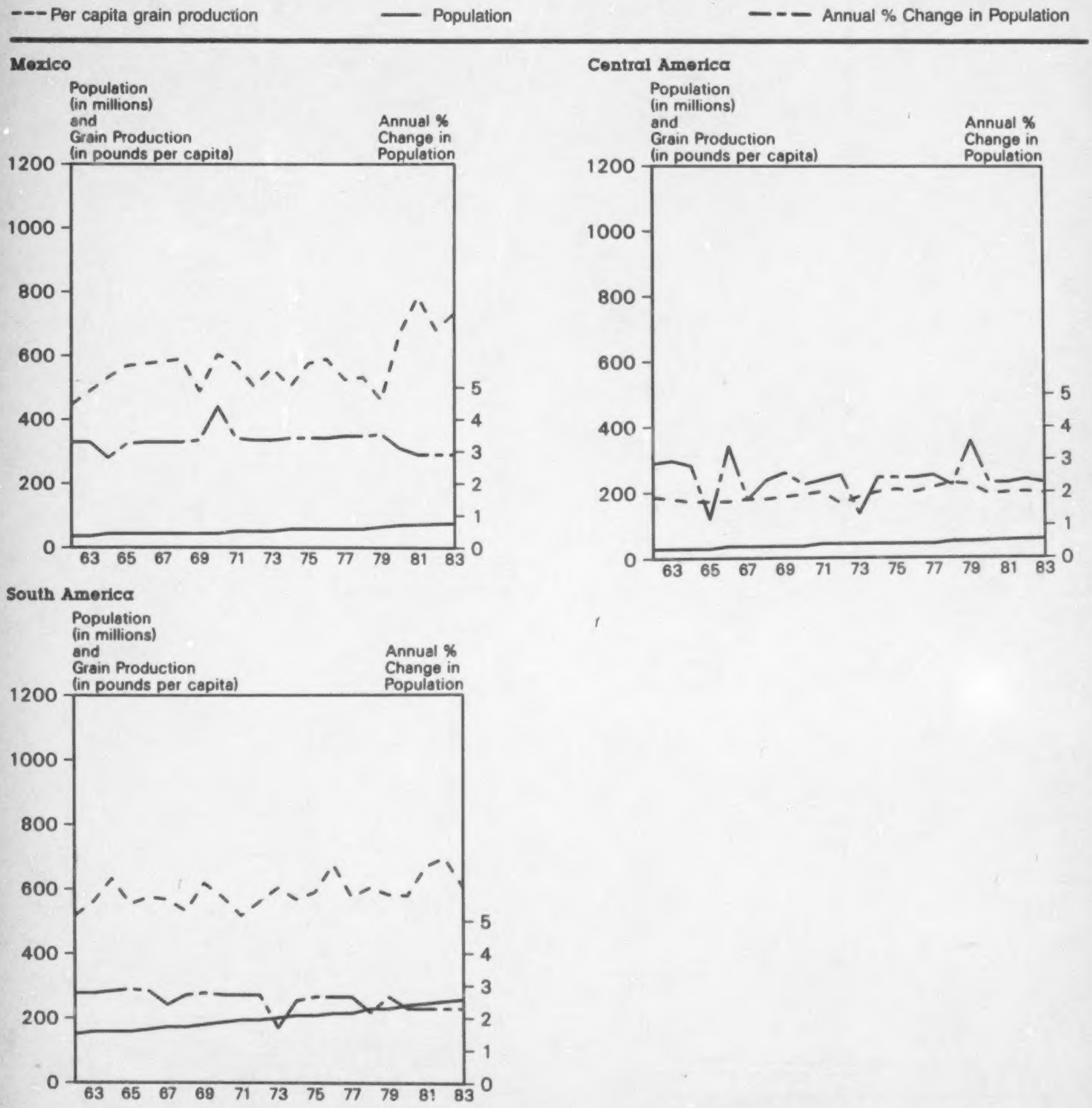
Note: Unusual yearly fluctuations in the population growth rates are due to data limitations in population series for developing nations.
Source: Food and Agriculture Organization of the United Nations, *Production Yearbook, (Rome, Italy)*, various issues, and U.S. Department of *Commerce, Bureau of Census, International Population Dynamics, 1950-80, Demographic Estimates for Countries with a Population of 5 Million or More, (Washington, D.C.), 1981.*

Appendix I, Figure 2. Trends in Population, Population Growth Rates, and Per Capita Grain Production in Selected Areas of Africa and the Indian Subcontinent, 1963-83.



Note: Unusual yearly fluctuations in the population growth rates are due to data limitations in population series for developing countries.
Source: Food and Agricultural Organization of the United Nations, *Production Yearbook* (Rome, Italy), various issues and U.S. Department of Commerce, Bureau of Census, *International Population Dynamics, 1950-80, Demographic Estimates for Countries with a Population of 5 Million or More*, (Washington, D.C.), 1981.

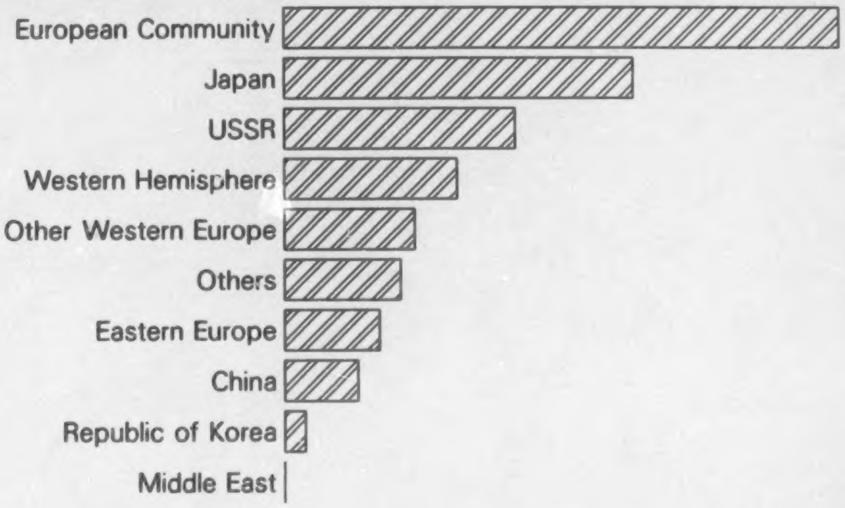
Appendix I, Figure 3. Trends in Population, Population Growth Rates, and Per Capita Production in Selected Areas of Latin America, 1963-83.



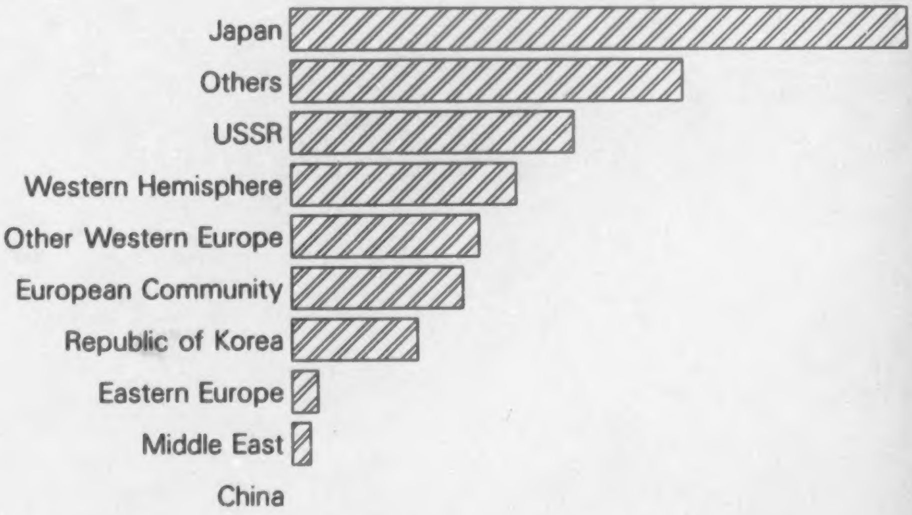
Note: Unusual yearly fluctuations in the population growth rates are due to data limitations in population series for developing nations.
Source: Food and Agricultural Organization of the United Nations, *Production Yearbook* (Rome, Italy), various issues and U.S. Department of Commerce, Bureau of Census, *International Population Dynamics, 1950-80, Demographic Estimates for Countries with a Population of 5 Million or More* (Washington, D.C.), 1981.

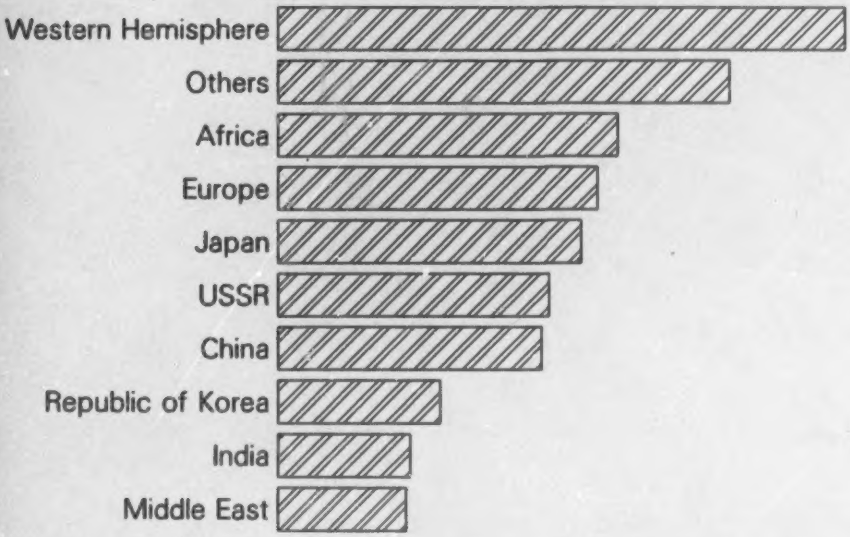
Appendix II. Flow Patterns and Table Showing Destinations and Ports of U.S. Grain Exports in 1973-74 and 1983-84

Appendix II. Figure 1. Relative Shares of U.S. Corn Exports to Major Foreign Destinations in 1973-74.

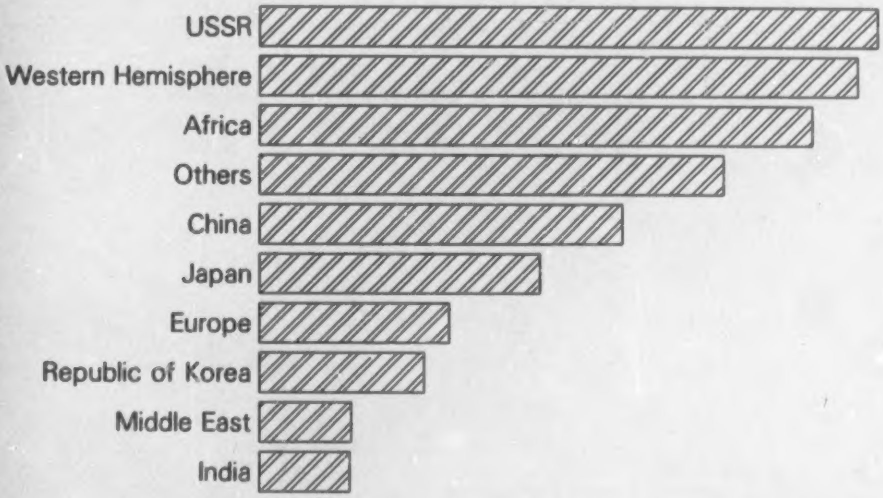


Appendix II. Figure 2. Relative Shares of U.S. Corn Exports to Major Foreign Destinations in 1983-84.



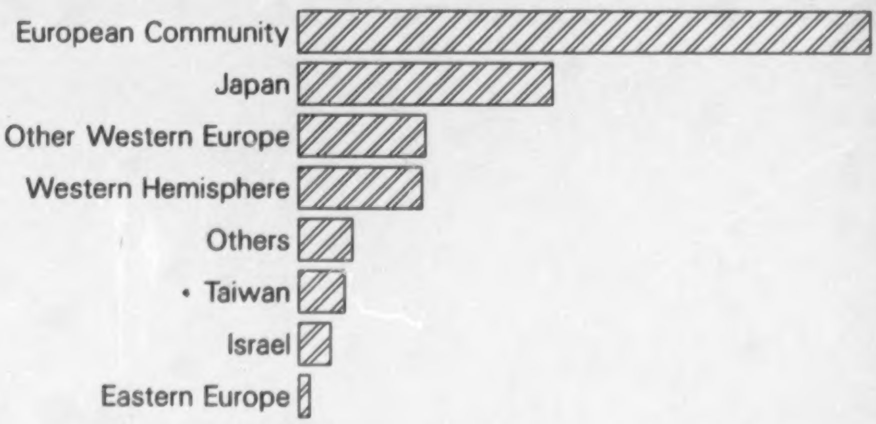


Appendix II. Figure 3. Relative Shares of U.S. Wheat Exports to Major Foreign Destinations in 1973-74.

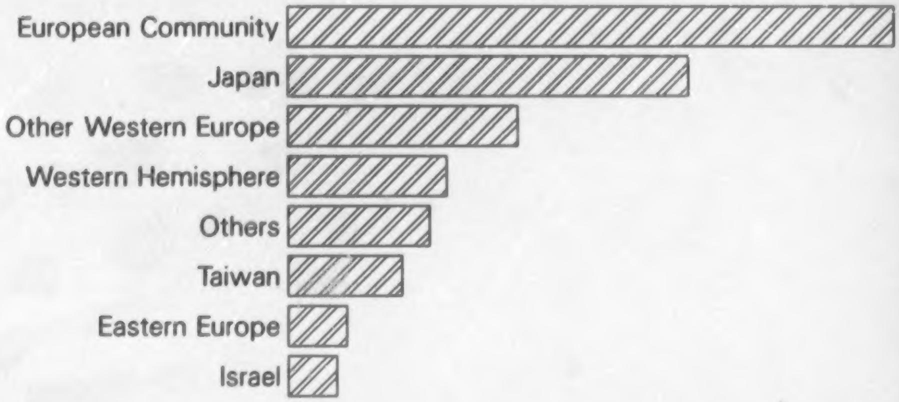


Appendix II. Figure 4. Relative Shares of U.S. Wheat Exports to Major Foreign Destinations in 1983-84.

Appendix II. Figure 5. Relative Shares of U.S. Soybean Exports to Major Foreign Destinations in 1973-74.



Appendix II. Figure 6. Relative Shares of U.S. Soybean Exports to Major Foreign Destinations in 1983-84.



Appendix II, Table 1. U.S. Grain and Soybean Exports in Thousands of Metric Tons by Port Areas, October-September 1972-73 and 1983-84.[a]

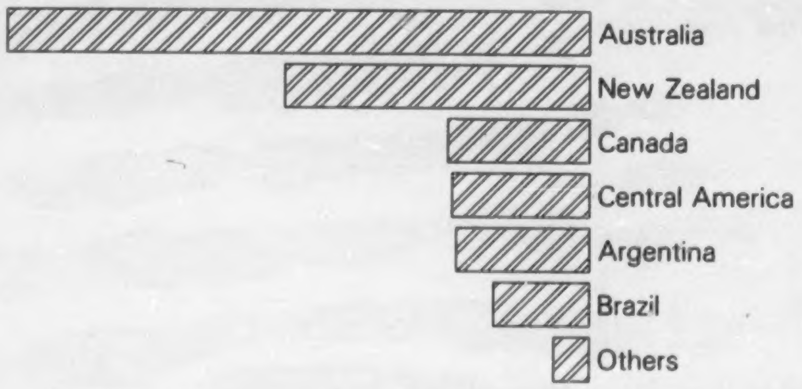
Commodity	Fiscal Year	Lakes	Atlantic	Gulf	Pacific	Interior	Total
Corn	1983-84	2,093.94	3,453.56	28,709.05	11,399.33	826.77	46,482.65
	1972-73	4,048.28	5,956.04	20,723.66	44.70	0	30,772.68
Wheat	1983-84	2,362.23	1,389.04	26,171.73	11,364.92	0	41,287.92
	1972-73	3,231.40	2,373.99	21,070.15	8,885.80	0	35,561.34
Soybeans	1983-84	826.81	1,661.26	15,520.71	330.42	676.92	19,016.13
	1972-73	1,840.79	1,232.60	9,630.48	0	0	12,703.87

[a]Source: U.S. Department of Agriculture, Agricultural Marketing Service, *Grain Market News* (Independence, Missouri), various issues.

Appendix III. Flow Patterns Showing Sources of U.S. Pork and Beef Imports

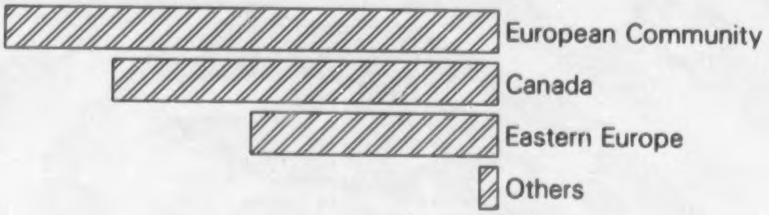
Appendix III. Figure 1. Relative Shares of Dollar Value of U.S. Beef and Veal Imports from Major Foreign Origins in 1983-84.

Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), November-December 1984.



Appendix III. Figure 2. Relative Shares of Dollar Value of U.S. Pork Imports from Major Foreign Origins in 1983-84.

Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), November-December 1984.



Appendix IV. U.S. Concessional Farm Product Exports by Commodities and Program Areas, 1977 and 1979-84 Fiscal Years

Appendix IV, Table 1. U.S. Concessional Government-financed Agricultural Exports by Commodities and Program Areas in Millions of Dollars, Fiscal Years 1977 through 1984.[a]

Commodity and Fiscal Year (October-September)		PL-480				
		Title I Long Term Credit Sales	Title II[b] Donations	Aid Mutual Security	Total[c] Government Programs	Concessional Program Exports as Percent of Total Exports
1984	Wheat and Flour	525.5	55.3	0	580.8	8.6
	Corn	53.3	20.4	92.3	166.0	2.4
	Soybean Oil	76.9	98.5	.4	175.8	27.8
	Cotton (exc. Linters)	12.4	0	0	12.4	.5
	Milk-Nonfat Dry	0	34.8	.2	35.0	18.8
	Others	94.5	191.8	10.8	297.2	1.4
1983	Wheat and Flour	471.1	159.6	29.8	661.5	10.6
	Corn	75.3	10.2	47.5	133.0	2.3
	Soybean Oil	87.0	48.5	0	135.5	29.3
	Cotton (exc. Linters)	9.4	0	0	9.4	.6
	Milk-Nonfat Dry	0	12.8	0	12.8	8.7
	Others	154.5	59.7	52.5	266.8	.8
1982	Wheat and Flour	497.6	69.3	0	567.0	7.4
	Corn	36.1	9.0	38.9	83.9	1.4
	Soybean Oil	75.8	60.3	1.9	138.0	27.7
	Cotton	9.2	0	0	9.2	.4
	Milk-Nonfat Dry	0	11.2	0	11.2	27.3
	Others	103.6	135.4	41.5	280.5	1.2
1981	Wheat and Flour	495.1	83.0	0	578.0	7.2
	Corn	78.3	30.9	57.0	166.3	2.1
	Soybean Oil	73.3	96.6	0	169.9	38.5
	Cotton	3.2	0	0	3.2	.1
	Milk-Nonfat Dry	0	34.5	0	34.5	58.7
	Others	123.0	241.3	84.3	449.1	1.8
1980	Wheat and Flour	531.5	87.6	11.5	630.5	9.6
	Corn	88.0	31.4	28.5	147.8	1.9
	Soybean Oil	62.8	109.4	0	172.2	22.0
	Cotton	12.3	0	0	12.3	.4
	Milk-Nonfat Dry	0	22.7	0	22.7	53.4
	Others	164.8	225.4	142.8	533.0	2.4
1979	Wheat and Flour	542.1	76.2	1.0	619.3	13.0
	Corn	63.5	12.5	146.8	222.8	3.7
	Soybean Oil	34.4	85.5	1.8	121.8	17.3
	Cotton	18.4	0	0	18.4	1.0
	Milk-Nonfat Dry	0	22.8	0	22.8	83.4
	Others	134.3	196.1	154.5	485.0	2.6
1977	Wheat and Flour	386.9	82.4	57.0	526.3	17.5
	Corn	44.8	5.5	142.3[d]	192.6	2.5
	Soybean Oil	69.3[e]	23.9	31.0	124.2	22.0
	Cotton	18.0	0	0	18.0	1.2
	Milk-Nonfat Dry	0	81.5	0	81.5	99.8
	Others	240.8	148.7	188.7	578.2	4.2

[a] Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), January-February 1985 and various other issues.

[b] Donations include voluntary relief agencies, The World Food Program, foreign donations, and government-to-government donations.

[c] May not add due to rounding.

[d] Mutual Security shipments estimated from the relationship between corn and feed grain exports.

[e] Title I shipments estimated from the relationship between soybean oil and soybean and cottonseed oil exports.

Appendix IV, Table 2. U.S. Concessional and CCC Financed Agricultural Exports in Millions of Dollars, Fiscal Years 1979 through 1984.[a]

	Fiscal Year Ending September 30				
	1979	1981	1982	1983	1984
Total Concessional Programs (from Appendix IV, Table 1)	1,490.1	1,401.0	1,089.8	1,219.0	1,267.2
CCC Programs:					
GSM-101	63.2	118.6			
GSM-102 (Credit Guarantees)		1,743.6	1,386.5	3,420.2	3,172.7
GSM-102 (Blended Credit)				648.9	473.6[b]
GSM-5 (Interest-free Loans for Blended Credit)					
GSM-201 (Breeding Stock Loans)					
Total CCC Programs	63.2	1,862.2	1,386.5	4,069.1	3,646.3
Total Concessional and CCC Programs	1,553.3	3,263.2	2,476.3	5,288.1	4,913.5
Concession and CCC Programs as Percent of Total U.S. Agricultural Exports	4.9	7.5	6.3	15.2	12.9

[a] Sources: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States* (Washington, D.C.), January-February 1985 and various other issues; U.S. Department of Agriculture, Foreign Agricultural Service, *Summary of Exports GSM-101; GSM-102; GSM-201; GSM-301*, unpublished material (Washington, D.C.), December 1982; and *Notice to recipients: Summary of FY 83 and FY 84 Export Values and Quantities* for GSM 102 and blended credit, unpublished material (Washington, D.C.), January 1985.

[b] Extra GSM-102 used for the blended credit program.